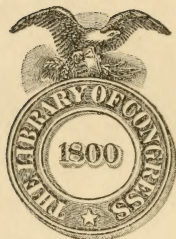


EVERYMAN'S
GARDEN
IN WARTIME

CHARLES A.
SELDEN



Class SB321

Book 54

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EVERYMAN'S GARDEN
IN WARTIME

EVERYMAN'S GARDEN IN WARTIME

BY
Albert
CHARLES A. SELDEN



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no. 1.

TO
MICHAELANGELO FRIERI

Whose years of loyal and cheerful cooperation,
whose garden sense, inherited from many
generations in the vineyards of
his ancestors in Italy, made
possible and profitable
the farm and garden
of an amateur in
New Jersey.

PREFACE FOR 1917



Amateur gardening, which was formerly one of the gentler pastimes, like fishing, has become now a matter of stern duty and grim necessity. To feed the civilized world is the huge task that confronts the United States this year; and every American who cultivates a garden plot is "doing his bit" for his country and for civilization. They also are soldiers who fight with hoe and garden fork as well as those who carry rifles.

Successful gardening requires more than good intentions. All the energy and industry a man can give to it will probably result in failure, unless his efforts are intelligently directed. Ground that is spaded up with high hopes will yield little beyond a lame back and sore hands unless the gardener knows how and when to plant and cultivate. Acres of land and bushels of seed will be wasted this year for the lack of one thing—knowledge.

With the purpose of reducing waste and disappointment, and with the aim of helping the amateur gardener to bring forth fruits "some an hundred

PREFACE

fold, some sixty and some thirty" this book is written. Based on long experience of what has been done and can be done, it is a practical book, and the author's aim is always to convey his information in a clear, simple and practical manner. It is especially adapted for the help of the suburbanite, the man who with his own hands is cultivating a piece of land and who, for his own sake, and for the sake of all of us, wants to get the best results from his efforts.

PREFACE



HOW THE BOOK FITS THE GARDEN

Save for the parts on all-the-season matters, such as preparation of the soil, fertilizing, protection against pests, and the pocketbook advantage of raising your own vegetables, the chapters of this book are placed in chronological order, with reference to the many things to be done in a garden in the course of a year, listed, for the most part, under the weeks in which they best may be done.

An amplified table of contents affords suggestions as to what should be attended to in any given period and is intended to be a guide in planning, not only for the moment, but for any future time in the life of the garden. This is supplemented by the summarized calendars and for quick reference to any particular fruit or vegetable or fertilizing formula, or to any specific piece of work, there is an index.

With such slight rearrangement and editing as

P R E F A C E

were necessary for transfer from magazine to book the material is the same as it appeared through all the growing weeks of the year in *The Country Gentleman*. Putting it between covers is in response to requests from readers of that periodical; with the writer's acknowledgment to the Curtis Publishing Company of its courtesy in permitting him to comply with those requests.

C. A. S.

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EVERYMAN'S GARDEN
IN WARTIME

CHAPTER I



COLD WEATHER PLANNING AND READING

Too often the calendar for the planting of seed starts with April — March at the earliest — and closes with September, as if the world of the gardener began with a spring radish and ended with a winter turnip. This may be because the calendar-maker, who probably never plants anything, loses sight of the fact that to the true philosopher of the hoe there is no winter. What is called so, merely as a convenience in dividing time, begins, according to the almanac, on December twenty-first. But it really ends there, too, for at that very time the days begin to lengthen and there is nothing like knowing that today has a fraction of a minute more sunlight than yesterday to revive enthusiasm for planting and to stir into life the winter vision of the garden to be.

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That vision-garden is of real fruitfulness. The better and bigger its crop of plans and hopes the more fresh vegetables there will be on the dreamer's table six months later. You raise the dreams in rows or broadcast, according to fancy, on the snow-covered, frost-filled patch that looks so barren to those outside the cult.

So the calendar should say "plant now," meaning the first of February or any other time after the winter solstice on December twenty-first—in northern latitudes it might be well to wait till just after Christmas—and then should follow the cultural directions for the beginner.

An ideal location for the vision-garden is in front of an open fire in an out-of-town house, although suburban stove or radiator will do almost as well, and some wonderful crops have been grown in city flats and even in hall bedrooms equipped with oil heaters ready to form a protecting smudge, such as they use in orchards, to save the dreams from winter-killing when the janitor shuts off the heat. Having selected the site, build a small air-castle in one corner, shielded from northeast winds, for the storage of bulbs, watering pot, gardening tools and

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seed catalogues. If the gardener is short of building materials for such a structure he may use the seed catalogues themselves. They make wonderful air-castles of regular skyscraper dimensions. May the poets who write these catalogues and the artists who illustrate them never grow less fanciful and colourful! They show the tomato that everybody aspires to raise and therefore give the benefit of an aspiration. They fill the picture pods with picture peas that Nature never knew. They produce strawberries bigger and redder than those your grandfather remembers as growing in his grandfather's garden when he was a boy.

So these catalogues serve a useful purpose by furnishing an ideal. It is easy to prove. Let one gardener struggle to raise a potato that will conform to the dimensions and shapeliness of the pictured vegetable, that will rival the mealiness of the description. Now let his neighbour be contented to take as his model such a potato as he can buy at the grocery store. Which will get the better crop?

Pencil and paper are indispensable tools for this February job of sowing dreams, because the garden

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grows so fast that unless you keep strict account one thing will overrun another and neither will do so well. Begin by drawing the outer boundaries, making the plan oblong if you have the room; if not, square. It is better to have a circle or a triangle or any other shape known to the geometry-makers than not to have a garden at all. The long garden is simply the ideal sort because of the economy of time and strength in caring for it. It is easier to do the hoeing up and down long rows, especially if you use one of those handy little wheel hoes.

For the same reason put plants of similar size and shape and those which require similar treatment in the same part of the garden. If you do not want to plant enough peas, for instance, to fill out one or more complete rows finish out the vacant place with bush beans, so that the two kinds of vegetables which are to be cultivated in the same way may receive attention at the same hoeing without unnecessary effort. That is a point one is apt to forget while working in the vision-garden across which you can stride without getting up from the arm-chair. But minutes do count when the real fun and business begin, especially if you are commuting

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and that 5:19 train is apt to be late and cheat you out of your weeding hour, or if your wife insists on your going to church Sunday morning.

In running things together on your preliminary sheet of plans do not forget to leave space for the subsequent plantings of the same thing. A garden is only half a garden that does not provide for successive crops and a continuous feast all through the growing season.

Eggplants and peppers naturally go together in a separate group not far from the tomatoes — three things which will not come on the stage until the rest of the garden is well under way. Beets, turnips, carrots and parsnips belong in the same section; the cabbage and cauliflower in another. Give the potatoes as much room as you can spare. Nothing gives the amateur such a boastful, professional-like feeling as to raise his own potatoes. Not that it is difficult, but they seem so much more like real staple food supply, so much more businesslike than radishes, for example. Of course the suburban gardener who actually raises enough potatoes to carry him through the winter becomes a political economist and is qualified to deliver lectures at the church men's

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club on the high cost of living problem and how to prevent famines in China.

Onions, for which you will put out sets without bothering with seed, deserve good room. If you do not love them now get the appetite. They are better for next winter's colds in the family heads than many grains of quinine.

The corn, as even the amateur having his very first garden dream must know, grows high and so makes shade. It must be placed where its waving stalks will not cheat the other inhabitants of their fair share of light and air. The same thing is true of the pole-twining limas.

As the proof of the garden is in the eating of the meals that come out of it there must be salad material in abundance. So make generous allowance for the lettuce bed — one that will last all summer by planting new ground and replanting on the old. Then draw a series of circles and mark them for the cucumber hills. To provide the dinner dessert or the breakfast appetizer give the melon patch all the space you can on your mid-winter paper plan. Then add a few more square feet to that and, finally, leave a marginal strip for a strawberry bed.

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The amateur gardener reading his latest book on horticulture, and his classically ambitious daughter at the other side of the library table doing her after-dinner school work in Latin, may be reading practically the same thing without either realising it.

Somewhere in his guide book, printed for the coming season, the gardener will be warned not to try to work his ground before the March winds have dried out the mud left by the departing frost. He will read that wood ashes are excellent for the soil, that he must be generous with the manure pile, that he must put each thing in the place best adapted to it, that after harrowing or raking his ploughed or spaded ground it will help the soil a lot to smooth and pulverize the surface still further by dragging brush over it.

On her side of the droplight the schoolgirl, with an occasional sigh and frequent fluttering references to the vocabulary in the back of the book, will manage to dig the following translation out of her Virgil, written two thousand years before her father ever thought of having a garden:

“In early spring, as soon as the dissolving snow melts on the white mountains and the earth crum-

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bles, unbound by the wind, even then let my plough be pressed down. But before our iron cuts an unbroken plain, first let us learn with care the winds and changing habits of the sky, the natural culture and disposition of the ground and what each plot will produce or refuse to bear. Here corn grows happiest, there the vines; there flourish fruit trees best and herbs unbidden spring.

“Be not ashamed to soak the arid soil with rich dung or freely to cast the smutty ashes on the exhausted fields. Very greatly does he help the fields who with harrows breaks the sluggish sods and drags over them the osier hurdles.”

And so on, through all the practical garden book of the present and the pastoral of 40 B. C., or thereabouts, will be found corresponding hints to the gardener, the chief difference being that the first is in prose and the other in blank verse.

Virgil himself was, comparatively, a modern garden writer. They used to accuse him of stealing a lot of his agricultural lore from Hesiod, who had advised the Greeks how to manage their crops seven centuries or so before Virgil saw his first dandelion, or whatever the early spring flower happened to be

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in his part of the world. But when Hesiod gave his advice the world already had been following it for ages.

That is one of the fascinating things revealed by books about having a garden — the continuity of the thing. You are doing what the ancients did in practically the same way, for the same purpose and getting the same results. Of what other form of human activity can this be said?

Of course we have more tools, some of them made for the profit of the dealer rather than for the benefit of the garden, and we have more books, covering a thousand more details — see the United States Agricultural Department's list of free literature — but on the fundamental principles there is little new. The most modern government writer in Washington is giving the gardeners of the country the same good advice on the main points that Virgil gave the Romans and Hesiod the Greeks.

However, after a little winter reading of the classics, just for fun and to give an added touch of sentiment and tradition to the work with the hoe — to exalt the manure pile, so to speak — it is better to switch to the modern books to save time and to

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get specific instructions in details. It is remarkable how numerous and how good those books are — there are enough of them, almost, for every gardener to have his own pet volume, and not the same as his neighbour's. There are probably more pamphlets on radish culture, for example, than on the care of babies. Begin this book-learning part of your garden work by writing to the agricultural experiment station of your own state and to the Agricultural Department at Washington for their lists of free publications. This suggestion is as much for the man with a ten-foot garden of flowers or vegetables as for the farmer with many acres, for no patch of ground is too small for the Government to recognise as worthy of cultivation and no problem too simple for its aid.

Provided with the lists, which include subjects all the way from pig management to violets, the amateur gardener can select the pamphlets that cover his particular needs and be sure of finding in them all the help he wants.

If your neighbour in the country happens to be a professional gardener or a farmer who takes no stock in scientific methods — there are a few such

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left — be friendly and tell him about your advice from Washington, for it will amuse him. And you may be sure he will watch your garden as closely as he does his own, for, no matter how much he scoffs, he cannot help being curious. Produce a good crop of this or that, and he will come round sheepishly and ask if you mind lending him that book.

Then you will have the satisfaction of being in the rapidly growing army of agricultural missionaries, recruited each spring from the thousands of “city greenhorns” who move to the land but who must, because of their ignorance, preface actual experience with reading what experts have written, and who thus learn a thing or two to show the men who have tilled the ground all their lives.

CHAPTER II



SAVING THE FAMILY PURSE

THE figures that follow are only approximate. Every gardener or grocery-store patron probably could add something to or subtract something from them, but they are near enough to a fair average to demonstrate that Everyman's garden may materially lessen the family's cost of living.

One quart of seed corn is enough to plant one hundred hills. It costs about thirty-five cents. The one hundred hills, under normal conditions and with reasonable care, should produce six hundred ears — that is, fifty dozen. For good early corn at the store the householder pays about twenty-two cents a dozen — for the fifty dozen eleven dollars, as against thirty-five cents for raising the same amount in Everyman's garden. Does such a garden pay? It would seem so.

Take potatoes. A peck of seed, enough for four

SAVING THE FAMILY PURSE

rows, each twenty-five feet long, costs from seventy-five cents to a dollar according to variety; eighty-five cents is a good average. This seed ought to yield six pecks, or a bushel and a half. New potatoes sell at the best stores when they first come into market as high as a dollar and a half a bushel. The bushel and a half which Everyman might grow from his eighty-five cents' worth of seed would cost him two dollars and a quarter at his grocer's. The potato corroborates the corn as to the benefit to the household account to be derived from intelligent use of the soil back of the house.

Why pay eight cents apiece for the first cucumbers and five cents later on? A small packet of seed, costing not more than ten cents, will plant twenty hills, which will yield at least six dollars' worth of cucumbers, at store valuation.

Thirty-five cents will buy a quart of seed for four twenty-five-foot rows of bush beans, enough to supply the average family for three weeks. Beans sell at the store at ten cents a quart. One good mess from the grocer costs more than the seed for all four bean rows in the garden.

The earliest peas, those that every man with a

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normal appetite and healthy enjoyment of food expects to have on his table not later than the middle of June, or by July Fourth in New England, cost seventy-five cents a peck. For twenty cents he can get a pint of seed that will give him a fifty-foot strip of peas in his own garden. And nobody who has eaten peas from his own garden ever wants any more from the store. He may eat beans or potatoes or carrots from the store or the huckster's wagon; to save himself from starvation he might nibble a little of the grocer's flavourless, three-day-old corn; but for the grocer's peas his own vines have spoiled him for all time.

The price of melons or cantaloupes runs all the way from two for a quarter to six for a quarter, according to season. But for twenty cents Everyman can buy enough seed for twenty-five hills of melons, which should enable every member of his family to have a whole one for breakfast every morning during the season.

This story of the garden, as told in dollars and cents, holds true for every vegetable on the list. And the cost of fertilizer, whether from the chemical factory or the barnyard, amounts to so little for the

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small garden that it hardly detracts from the balance on the right side of the table expense account. It is much more than offset by increased nutriment values, by better health and digestion, and by greater satisfaction of all the members of the family — all of which come from eating absolutely fresh vegetables rather than the wilted sort from the store or cart.

After allowing two dollars for one day of hired help on the preliminary spading, or five dollars for the services of a man and team with plough and harrow, there is no labour cost to Everyman's Garden because there should be no labour, in the burdensome sense of the word; nothing but pleasure and the most wholesome sort of exercise. Instead of charging anything for his own time and effort, the gardener might go so far the other way as to put his work down as profit — a saving of doctor's bills and athletic club dues.

Of course the saving on the cost of living by means of a garden is not confined to the actual growing season. There are canning and preserving possibilities to be taken into consideration. From the summer surplus of the garden a large part — by far the most palatable and healthy part — of the food

SAVING THE FAMILY PURSE

supply for the coming winter can be obtained in the shape of canned peas and beans, corn and tomatoes, pickled cucumbers, and various other things that every housewife knows about. The canned products of home raising and preserving are fully as preferable to the store supplies in tin as are the fresh vegetables superior to the stock of the huckster's cart, and the margin of nutriment and safety to health is much greater.

Then, too, there are the regular winter vegetables — potatoes, carrots, turnips, onions, parsnips, celery and all the rest that are to be stored. Nothing makes Everyman in his garden feel quite so important, so much a man of substance in the community, as to produce, for the first time, his winter supply of these vegetables.

To get all that food and satisfaction it is worth while to take pains and do the thing in the best way. So here are some suggestions for that household staple, the potato. In the first place do not plant potatoes where they were last year. As a matter of fact the longer interval between two plantings on the same piece of ground, the better, for potatoes are subject to several diseases, notably scab, the

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germs of which remain alive in the soil from one season to the next and attack the following crop. These scab germs may be on the seed potatoes themselves, so it is well, before cutting, to soak them for two hours in a solution of a gill — four ounces — of formaldehyde in seven quarts of water or to put them in an air-tight outbuilding or a room in the cellar and burn there a formaldehyde candle, which may be bought for a quarter or less at the drug store.

The next question is cutting. Commercial growers, as a rule, leave two eyes on each seed piece to be put in the ground. For the amateur a sensible thing is to cut each in halves.

As potatoes grow all the way from coast to coast and from Alaska to Mexico no amateur gardener in the United States need fear to try a crop. However the ideal soil is a sandy loam and it must be well drained, for too much moisture will rot the seed. If there is no such soil available its advantages may be obtained, in part at least, by drainage and by the ploughing under of a lot of barnyard manure, not only to enrich the soil but to loosen it.

Deep tillage is necessary in preparation of the ground, and after the ground has been thoroughly

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ploughed the seed pieces should be covered by four inches of earth. The potato cannot thrive if it is skimped in its supply of nitrogen, phosphoric acid and potash. Barnyard manure will supply these in sufficient quantity and right proportions, but if the soil is naturally of the right texture or has been heavily manured for a season or two before, it is better to use a chemical fertilizer. No fertilizer of any sort should come in direct contact with the seed.

If ground space is ample plant in hills two feet apart each way — two feet and a half is better for cultivation. Drop three seed pieces in each hill. If space is limited plant in rows, or drills, two feet apart and drop two seed pieces every foot in each row.

CHAPTER III



GARDEN SOILS, GOOD AND BAD

LOAM is a mixture of sand or clay with many years' accumulation of decomposed vegetable matter, such as leaves, plant stems, rotted sod and weeds, and decayed fragments of wood. The base of this blend may be clay or sand or both, but it is not loam unless the rotted vegetable substance, technically known as organic matter or humus, is there in sufficient quantity and transforms it into a life-giving blend for more plants, which in their turn will die and add their stems and leaves, thereby increasing the loaminess.

No apology is offered for this definition of the very stuff of which the garden is made. To some it may seem as obvious and as unnecessary as to define water as a liquid, but, to nine amateur gardeners out of ten, soil terms, used so glibly by the experts, are a puzzle. Loam is one of them. Beginners

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read of sour soil and sweet soil, light soil and heavy soil, loam, sandy loam and clayey loam, and wonder what it all means. Fortunately they can go ahead and have very good gardens without solving the puzzle, but knowing why, in the long run, may become as useful as knowing how. At any rate, it adds one hundred per cent to the pleasure, if not quite as much as that to the profit, of having the garden.

In this respect you may look at your garden in several different figurative ways in addition to considering it as so many square feet of dirt out of which you can take flowers and vegetables every year for some reason or other that you know nothing about. In one sense it is a bank where you have principal on deposit in the shape of soil substance and fertility. The vegetable crop is the annual interest and that may be decreased from year to year to the vanishing point or greatly increased in quantity and quality according to whether you impair the principal or add to it.

Again, the garden is a chemical laboratory in which many wizard-like performances are always going on to produce the desired plant life. With the

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laboratory, as with the bank, the gardener must co-operate. He must know what chemicals are lacking and how and when, in what quantities and in what shape to supply them. We hear a great deal about scientific farming, comparatively little about scientific gardening. But a very little science will do as much in proportion for a back lot, otherwise hopeless for a garden, as it will for one of the much-talked-of abandoned farms.

So to begin with the soil — the ideal sort for the garden is the light and sweet sandy loam. The primitive way, assuming now the case of the man who has just moved from city to suburbs, is to plant the garden on the spot available, without knowing anything of its fertility or texture, past uses or abuses, and trust to luck and the hoe.

But in spite of constant and faithful work with that hoe and all the other garden tools, the vegetable interest returns on the principal invested in work and seed and manure may be scant as to quality and quantity. If the labour has not been skimped it may be taken for granted there is something wrong with the soil. If that fact is ascertained at the beginning of the season instead of at the end, as it may

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be, the defect can be remedied in advance and the very first season's attempt of the amateur made a success instead of a failure.

Too much acidity is one of the chief causes of failure on ground long neglected or misused — in other words sour soil. Whether the patch selected for the garden is sour or sweet may be learned absolutely by anybody not colour-blind at the cost of five cents in money and five minutes in time. The trick can be done winter or summer.

Invest a nickel at any drug store in half a dozen strips of blue litmus paper. Place one of them in a handful of soil where it is damp. If it turns red there is too much acid there; the soil is sour. Try the same experiment in various other parts of the garden with the other strips of paper, so as to get a line on the whole patch. If it shows enough acid to turn the paper the trouble can be remedied at small expense by sprinkling on lime, say, a pound for every twenty square feet, and raking it in. That is a liberal allowance; the same amount is put on to prepare land in the East for alfalfa, and no other crop is so absolutely dependent on sweetness of soil as alfalfa.

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To demonstrate to yourself what this lime will do for the whole garden dip one of the strips of litmus paper into water with lime in it and the telltale red spot showing sourness will turn blue again. If it is desired to make this soil test in the winter, to save time or satisfy any curiosity that may have been aroused by this hint, bring a lump of the frozen soil into the kitchen and make mud of it with some warm water.

The next question — Is the soil loamy enough? If it has been heavily fertilized for several years with barnyard manure it probably is, for the manure is full of straw and that makes humus. If the garden is a new one, made on land recently a lawn, the ploughed-under, rotting sod has furnished the humus. The same is true of land that has received a deposit, year after year, of dead weeds and leaves. Perhaps it is an old garden which has been manured in previous seasons and has taken back to itself the stems and foliage of many plants after the harvests.

In any of these cases it is better to use chemical fertilizers. They do not bring weed seeds into the garden, as will almost any manure from barnyards in the country where horses have a chance to supple-

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ment their grain rations in the barn with grazing in the pasture. Furthermore the commercial fertilizers contain, in the most quickly available form, the essential plant foods that the land is most likely to lack. They are easier to have delivered and to handle. A man may lug home by hand almost as much real plant food in a bundle as he would get in a load of manure.

There are special manufactured mixtures for different plants, but a very excellent brand for general garden purposes, particularly effective for fruit, is in this proportion: ten pounds of phosphate, five pounds of muriate of potash, and four of pure ground bone. That total of nineteen pounds, doubled, would be good for one year's fertilizing of a garden containing 1500 square feet, and ought not to cost more than three cents a pound. It should be broadcasted after the ploughing or spading has been done and then thoroughly raked or harrowed in.

Nitrate is not mentioned in this formula partly because the use of that chemical, which furnishes the very essential nitrogen, is a risky thing for the amateur. It is apt to give him a too luxuriant growth of leaf and stem of a beautiful, rich green, and too

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little fruit or vegetable. Nitrate also is much more expensive than potash and phosphate and there are two better ways of getting nitrogen into the soil than by using the commercial chemical.

One is to scatter hen manure on the land through the winter and let it soak in with the spring rain. Make sure it has worked well into the soil before planting, because seed in actual contact with this strong manure will die. Be liberal with the hen manure in the place where the beets are going to be planted, for they thrive best on lots of nitrogen just as all fruits, small or tree, thrive on potash.

The other natural, inexpensive way to get nitrogen is to plant clover, preferably crimson clover, in such part of the garden as you have taken the harvest from late in August. It will start its growth in the late summer, develop some in early fall, live through the winter and renew growth early in the spring. Then it should be ploughed under. It will carry with it quantities of nitrogen which it has absorbed from the air, besides making a valuable addition to the humus of the soil. Dig it under before it blossoms, otherwise its continued growth will rob the vegetable plants of too much moisture. Peas

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and beans have this same power to take nitrogen from the air and deposit it in the soil.

If the stems of plants are short and thin and wabbly, if the foliage is scant and turns yellow before it should, that is a sure sign more nitrogen is needed.

If the plant itself thrives, but fails to produce its fruit, that is a sure sign the soil needs potash and phosphate.

Fortunately for both farmers and gardeners nearly every state in the Union, through its agricultural experiment station, now undertakes to protect the public against worthless fertilizers by analyzing samples of all the commercial mixtures put on the market by seedsmen and the manufacturers. Reports of these examinations are published, giving names of the makers, the trade names of their products, and an exact statement of what each contains. These reports may be had for the asking.

This same experiment station of your state will examine a sample of your soil and, if possible, tell you what it needs. It is not so simple for the amateur who knows nothing of chemistry to tell about the potash, and so on, as it is for him to test for

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acidity. He must apply to the state's experts or wait for evidence furnished by the plants.

For gardens not rich in humus barnyard manure is the thing. Such gardens lack loam and their too sandy appearance will indicate that fact even to the amateur; or perhaps they have been treated too long without addition of humus.

Simply adding more chemicals to these soils will not solve the problem, because their texture is such that food is not made available for the plants even if it is in the ground in abundance. The ploughing under of the manure will break this ground up, make it loose — or friable, as the experts say — so it warms up more quickly in the spring and stays warm. Most important of all, it enables the soil to retain moisture because the more separate particles there are the more water there will be available to the plants.

CHAPTER IV



TOOLS THAT ARE ESSENTIAL

As displayed in the store window, leaning up against the big prize pumpkin, or as pictured in the garden-tool catalogue, a hoe is only a hoe; but in actual operation it is a good hoe or a poor one, according to its suitability for the particular gardener who is using it and quite independent of the quality of its make or materials. This is equally true of the rake, the spade and all the other implements needed for working in the soil.

So, then, let the gardener choose his hoe with as much care as a man would select his golf sticks or his baseball bat, billiard cue or tennis racquet. Don't order it by mail. Don't, after a long session with the dealer on the matter of seed, hurry away without a visit to the implement department, leaving it to the storekeeper to pick out any hoe he may have to add to your order.

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Examine the tools yourself. Heft the hoe, balance it, try it on an imaginary row of vegetables, consider the length and the weight of it, the diameter of the handle, the width of the blade. And if it doesn't fit you, if it doesn't hang just right, if the feel of it doesn't make you want to get right to work in the garden, it is not the hoe you ought to have. Try another and as many more as necessary till you find the hoe that was made for you.

This matter of selecting the tools is of real importance. It makes a big difference later on in the ease and pleasure with which the work is done. It means the difference between getting a backache or the best and most healthful development of the muscles of the back. If the hoe is right at the outset it becomes an object of genuine regard. The true gardener is an artist, and the tools of his art become something more to him than the mere implements of wood and metal.

For a good hoe in its second or third season, after the uncomfortable newness has been worn off the handle, after the blade has had its too square corners rounded a bit and its surface scoured bright by much contact with the soil, the gardener will have the same

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fondness that a smoker has for his favourite briar after it is seasoned. That feeling is out of the question if the thing is awkward and unwieldy at the start. Therefore put down the matter of buying the tools, all of them, as something that requires thought and real discrimination.

Don't buy too many. There are novelties put on the market every year that just cumber the garden patch, add much to the expense and nothing to the ease or thoroughness of cultivation. A spading fork, a rake and a hoe are the three prime essentials. A castaway on a desert island with those three things only could run a very creditable garden; but the list may be lengthened to great advantage to include a spring tooth weeder, a spade, a wheelbarrow, a reel and line, a trowel, a dibber, a hand pump for insecticide spraying and a bellows for dusting plants.

In every such list, whether long or short, there should be mentioned, very near the top, the gardener's ten fingers. For the perfect, weedless garden the human hand is an indispensable tool. No manufactured implement can take its place. After the most thorough hoeing and raking and the closest

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possible work with the weeder, there are those hidden spears of grass and first leaflets of the oncoming weed close against the stem of the flower or vegetable plant, ready to choke it and cheat it of its full share of soil nourishment, if left till next hoeing time. It is in getting rid of these little things that the best gardening is done, and must be done, with the fingers. Furthermore there is nothing so effective as the hand in pulverizing the soil about any particular pet plant which the grower wants to bring to perfection just as an example of what can be done.

In the minimum list of essentials the spading fork is mentioned rather than the spade, because nobody but the amateur with nobody to advise him ever spades with a spade except when the job must be combined with the work of cutting off the tag ends of a lot of old roots or slicing through sod.

The spading fork, with its four broad tines, is better for many reasons. It goes into the ground much more easily, so more ground can be turned with it for the same amount of energy and muscle power than with a spade. This saving of strength is of real importance to the man whose gardening must be done in the odd hours and who is not used to dig-

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ging. The tines of the fork, instead of compacting the soil and causing it to cake, as the solid spade does, serve to loosen and pulverize it with every forkful that is turned over.

For the symmetry of a garden the reel and line are needed. Trying to hoe a straight drill for seeds by guesswork and the eye is unsatisfactory work. It can't be done. And a garden of crooked rows is not only a thing that you don't care to have your friends see but something that cannot be cultivated with economy of time and effort. So get the reel and line and stake and have a true, geometrical guide for every row and every section of the garden. Of course an ordinary string will do, but not so well. It will snarl and, being of no account, will be left round to clutter the place or else lost before it is time to use it again. The reel should have a long metal handle that can be thrust into the ground and held firm while the line is unwound and carried to the other end of the row.

No garden patch is too small to have a wheelbarrow. It saves thousands of steps in the course of a season, from the time it is used for carting manure about in the spring to the harvest season when the

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crop is taken to the kitchen door. It is handy in the work of transplanting. It is good for the removal of rubbish. It will hold the watering pot or the hose reel and all the tools, thus reducing the evening job of putting things away to one trip from garden to shed.

There are all sorts of hoes. If you are to have only one, by all means get the pointed, heart-shaped one. It will do the ordinary work of surface tillage and cutting the weeds almost as quickly as the square hoe; besides that, it will make a drill or furrow for seeds of just the right depth and angle of opening by simply drawing it down the line of planting. Also, its pointed blade enables you to work much closer to the roots of the plants without bruising the leaves and stems. And, still another argument, it is lighter and handier to use and cuts into the soil much more easily, especially if the earth is hard or stony.

The push hoe, or scuffle hoe as the English gardeners call it, is also a useful but not indispensable thing to have round the garden. It looks something like an old-fashioned hand mincemeat chopper on a long handle and is pushed along on the surface or

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just under it to cut off small weeds between the rows. It is of no use for heavy weeding or on ground not well cultivated.

Its chief advantage is that in the work of weeding the occasional use of the scuffle hoe is rather restful because pushing, substituted for pulling, brings into play a different set of muscles. That may seem a very trivial reason to a man sitting in a comfortable chair several weeks before outdoor work can begin; but the cumulative saving of strength in a thousand little ways means a great deal. It helps conserve the gardener's enthusiasm of the early spring all through the summer and to make it proof against the discouragements of poor crops and drought and pests.

The rake is as useful as the hoe or the fork, but it serves a different purpose. It is to the garden what the harrow is to the field and should follow the fork to smooth the surface and pulverize the soil. It should be used for the same reason after each hoeing. In fact it cannot be used too often, because the finer the soil the more moisture it retains beneath the surface where the roots can get it in a dry time. And nothing adds more to the good appearance of

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a garden than a level, well raked, finely lined, weedless, grassless surface.

For the very necessary pulverizing an old board or a bunch of dead tree branches or brush might well be added to the list of tools. Weight the board with a stone and drag it over the surface immediately after spading to break up all the clumps and clods. Follow that up with the brush to make the earth still finer; then use the rake.

As already said of the hoe, the rake must be selected with reference to its weight and balance and length of handle to suit the man or woman who is to use it. But it is well to get a wide one, at least as wide as the distance apart between the rows of the most closely planted vegetables. That means that one trip down the line covers the whole intervening space.

The weeder should have a short handle, one with which you get right down on your knees to put the finishing touches on the cultivation. There are many shapes and sizes of these hand weeders, but any one with three or four spring prongs will do the work. After you have used for one season the one you happen to select, you will talk and boast about it as

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the best thing of the sort ever invented. In that respect weeders are like automobiles or typewriters or babies.

For transplanting, particularly in the flower garden and for work with bulbs, the trowel and dibber are on the list of things one surely should have. Of course everybody knows what a trowel is and what to do with it. The dibber or dibble — either word is right — is simply a sharp-pointed, round tool of wood or metal, used for making the right size and shape of hole in the ground in which to drop a bulb or place the root of a plant that is being transplanted. Such a hole can be made with the trowel but not so well or so quickly.

As the fighting of insects and fungous pests must be done in every garden that is to amount to anything, the need of the spray pump and the dust-bellows is self-evident. There is no other method of getting the various insecticides and fungicides on the plants evenly and effectively, and unless the spraying or dusting is done so thoroughly that every part is covered, it is merely a waste of time and material wasted. A small fraction of a square inch left unsprayed will afford ample breeding space for

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enough of the particular thing you are fighting to ruin the plant you think you are saving.

No doubt there are other tools occasionally worth having for special conditions, but for Everyman's Garden the list here given is sufficient. If, after they and the seeds have been purchased, there is anything left of the family appropriation for the garden it may much better be spent on an extra bag of commercial fertilizer or an addition to the manure pile than on tool frills.

CHAPTER V



GARDEN EUGENICS

PREVENTION is as much more than cure in the garden as anywhere else. For nearly all the pests and diseases that torment plants there are now cures or approved methods of control, but nothing is quite so satisfactory as giving the garden the best possible start, thereby assuring such strength and health of plant growth that the weeds will have little chance, and the need of poisonous sprays and powders for the bugs and fungi will be reduced to a minimum. There is no question that weeds will outgrow plants on a neglected plat, but by a friendly dispensation of Nature the reverse is true where the tillage is good.

In the beginning there must be what might be called the eugenics of the garden — the seeing to it that flower and vegetable plants are well born from good seed in a perfect seedbed. With reasonable care

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thereafter the probabilities of a full harvest are excellent.

Watch the patch selected for the garden through the season of spring rains. If the water stands in pools that is all the evidence needed that there should be provided some form of artificial drainage. The suggestion of drainage frightens the average amateur because he knows nothing about it. In a vague sort of way he thinks of it as something that requires the skill of a civil engineer and the expenditure of much money — at any rate as something entirely beyond him. As a matter of fact the thing is very simple. In ordinary cases any man who knows enough to spade his own garden can drain it, and it need cost nothing but the work he puts into the job.

Dig a hole where the water collects in puddles. Go down three or four feet, getting out some of the hard clay soil that causes the water to stand on the surface, fill in with loose stones or old brush and then restore the surface of the garden by putting back the top soil. That is a drain in its simplest form. It is the same as punching a hole in the bottom of a tin dish. The water simply runs out.

If there are many wet spots in the garden it is

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better to dig a series of ditches, eight or ten feet apart and parallel to each other. Have them extend beyond the line of the garden on its lowest side and have their outer ends a trifle lower than where they start so the water will find a natural flow away from where it is not wanted. Fill in the ditches with a foot or a foot and a half of loose stones or brush, or put in porous tiles, and then throw back the top soil. That will drain that garden.

Even these simple devices are not necessary on sandy soil or where there is sufficient slope to take the water off by gravity. A little experimental digging here and there to learn what the subsoil is like and a close watch of the surface after rains will tell each gardener what his own needs are in this respect. If he discovers that drainage is necessary he mustn't neglect the matter or take a chance on having a dry summer. A dry summer for a poorly drained garden means soil that is baked and caked and cracked, that will produce nothing worth picking. A wet summer for that same patch means drowned seeds, mud, and plants rotted before they can produce anything.

With the underground work disposed of, the next

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step is the making of the seedbed — the all-important matter of tillage. Possibly there is a farmer nearby or a truck gardener with an hour or two to spare who will plough and harrow the patch. So much the better. That will save the spading which is the only real backache-producing work in the whole process of gardening from one end of the season to the other. It will also assure a deeper and more uniform turning over of the soil.

If this outside labour is available have the neighbour plough, then go over the ground with a disc harrow at right angles to the furrows and finish off with a spike or smoothing harrow. Don't ask the truck gardener to do more than that, for if you do he will be impatient and think you are a garden lunatic. But you can supplement his work to great advantage and make the surface soil still smoother and finer by dragging over it a bunch of brush and evening it off and, as the final touch, by drawing a board over it.

All this can be accomplished even if there is no man with a plough in the neighbourhood. The gardener's spade and rake and hoe are substituted for the horse-drawn tools of the professional and should

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be followed in just the same way by the brush and the board.

The chief purpose of this preliminary care and thoroughness is to get the ideal texture of the soil. The deeper the tillage, the more room for the expansion of the root system which must support the plant and give it strength to bear fruit later on. And the finer the soil is pulverized, the more moisture it will hold.

The beneficial moisture we are talking about now is sometimes called film moisture. It forms a film-like casing about each particle of the soil. Hence the necessity of having many particles, which can be obtained only by thorough fining. This water film dissolves the several chemical plant foods there are in the soil and gives the roots a chance to absorb them into the plant system.

Texture of the ground improves year after year with repeated cultivation if care is taken to renew the humus or decayed vegetable matter in the soil by spading under barnyard manure, which not only fertilizes but prevents the earth from becoming too compact.

Next in the sequence after drainage and prelimi-

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nary tillage or preparation of the seedbed come the planting of the seed and the cultivation and protection of the plants up to harvest time. There is not a day, from one end of the season to the other, except very wet ones, when a little raking and hoeing is not beneficial. Don't work the soil during or immediately after a heavy rain, because it will dry in lumps and hurt the garden. But the sooner a little cultivation is given after a light shower the better, for the stirring of the soil locks within it some of the new moisture that would otherwise escape by evaporation from the surface. In long-continued periods of dryness there must be daily cultivation. This is dry farming on a small scale. Dry farming, about which so much has been written in America recently, is simply the trick of making one drop of water last as long as a bucketful, by constant cultivation.

Hoeing and raking are not primarily for the extermination of weeds, but to conserve moisture. In a well-kept garden the weeds are so few and so small that the removal of them is merely incidental to the cultivation for other purposes.

So much for prevention of garden troubles by a right start and proper care thereafter; but sickness

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will creep into the most sanitary households and some pests will come to the best-regulated gardens.

This matter of garden hygiene is a big subject — so big, in fact, that if the amateurs should happen to read a full list of plant diseases and insects before he had his first enthusiasm aroused by his seed catalogue he might never try to have a garden. Fortunately the enthusiasm comes first and Everyman learns little by little that there are obstacles to be overcome. A real garden disaster that destroys all a man's work is as rare as a plague of cholera in a civilized country. It is only here and there that a crop fails entirely or does not come up to reasonable expectations in quality or quantity, and by that time Everyman has learned enough of gardening to meet these troubles philosophically and intelligently.

At the outset he may read the discouraging fact that the entomologists and plant pathologists have discovered and classified no less than three hundred different things that interfere with the growth of sweet corn, but he will go on year after year having reasonable success with his corn and never know any diseases in it but smut, and no enemy except the worm that begins at the top of the ear by the silk and eats

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its way down through the kernels, leaving an unsightly spiral trail. Neither of these things is a sufficient excuse for not planting corn next year. They are just an incentive to find out what the matter is. So, in one way or another, through his corn or his melons or his peas, the amateur learns that there is more to gardening than digging, planting and gathering the product. He wakes up to the fact that the spray pump is as important a tool as the rake. Then he begins to be a real gardener. He has his garden medicine cabinet and knows something of symptoms and general principles of plant health.

One sanitary thing to do, for example, is to lime the soil before planting. A pound of lime worked into the surface soil of every twenty square feet of garden is as clean and healthful a thing for plants as a coat of lime on the inside of the poultry house is for hens. Avoid diseases also by rotation of crops—that is, by not planting the same thing in the same place two seasons in succession. This applies particularly to potatoes and other root crops. Try not to bring trouble by using germ-laden manure or disease-tainted seed.

Pests may be classified. There are the fungous

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diseases, of which mildew is the most easily recognised by the amateur, and the several kinds of insects and worms which are also classified according to their methods of attack. Some of them bore, but these are in the orchard rather than the garden. Others eat the stems and leaves and fruit, and still another miserable crew just sucks out the life juices of the plant. The selection of the cures must be with reference to the weapons Nature has provided the creatures for their work of destruction.

For those that eat and chew things up the best remedy is Paris green, hellebore or arsenate of lead. Paris green, for instance, is the most popular poison with which to fight the potato bug, and the cutworm that ruins so many tomato plants, especially in long-continued dry spells. For the potatoes the poison can be blown on the foliage with a pair of bellows, but care must be taken that the under as well as the upper surfaces of the leaves are sprinkled.

To use this poison for the tomato plants it is best to mix it with cornmeal and scatter it on the ground round the plants. The cutworm almost never leaves the ground. He cuts off the stem at the surface. Of course the cornmeal method is not de-

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sirable if there are any chickens about. For the cut-worm and potato bug hellebore and arsenate of lead also may be used, as well as for all the pests of the chewing tribe.

For the sucking variety of plant destroyers there are the emulsions of kerosene, lime-sulphur sprays and whale-oil soap. Lime sulphur seems to have the weight of evidence in its favour now from the various experiment stations as a cure for scale insects that ruin fruit trees by attacking the bark. It may be applied as a spray for the good of the bark and, with a little arsenate of lead dissolved in it, makes a most effective poison application for the worms that attack fruit buds.

A gallon of water in which several plugs of tobacco have been steeped costs almost nothing as compared with the commercial mixture and will prove an excellent killer for insects on the stems and leaves of plants.

Peas are afflicted with mildew and attacked by weevils and the pea aphids or lice. For these troubles spray with Bordeaux mixture or powder the plants with sulphur. The weevil comes from bad seed, so the dealer must be depended upon to save

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you from that unless you select especially fine pods of your own growing for the seed supply for the next year. To get rid of the lice, brush them from the vines in the middle of a hot day.

To save the beans from both blight and pod spot, spray thoroughly with Bordeaux mixture as soon as the third leaf develops and every fortnight thereafter. A sprinkling of kerosene near the row will make the ground unlivable for a maggot that attacks beans.

Melons, squashes and cucumbers may be considered as a single group with reference to both disease and insect enemies. For the blight and mildew spray with Bordeaux mixture as soon as the vines begin to spread. The animal enemies are the melon worm, the squash borer and the cucumber beetle. Although named for the plants with which they are particularly associated, each one of these pests will attack all three vegetables — cucumber, melon and squash. Hellebore or arsenate of lead provides a good defence against these things.

Rust is the principal disease that attacks asparagus. It affects the tops and will kill the plants if allowed to go on unchecked. As it takes three years

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to get an asparagus bed into bearing it is worth while to control this disease and finally get rid of it. To do so dust the tops with dry sulphur soon after cutting the crop. Put it on early in the morning, when the dew will hold the powder, and repeat this treatment once a month.

Animal enemies of asparagus are the beetle and a maggot called the miner. As suggested by its name the miner gets under the skin of the plant near the ground. Trap by leaving a few uncut plants on which the miner-producing fly will lay her eggs. About the first of July these infested plants should be pulled out and burned.

The small asparagus beetle, less than a quarter of an inch long and brilliantly coloured in red, yellow and black, can be got rid of by dusting with air-slaked lime.

Most of the diseases to which the potato is subject may be avoided by intelligent handling of the seed before planting. In the first place select only the soundest, healthiest looking potatoes to cut for your seed. If possible know something about the soil conditions under which the seed was grown. After cutting sprinkle with sulphur — the old-fashioned

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method. A newer precaution, and perhaps a more effective one, as already suggested in the second chapter, is to place the seed in an air-tight room and there burn a formaldehyde candle as suggested in the second chapter. The same result is obtained by soaking the seed for two hours in a solution of half a pint of liquid formaldehyde to fifteen gallons of water.

For leaf blight spray the plant with Bordeaux mixture. By putting an ounce of Paris green in every ten gallons of the Bordeaux mixture you get a combined insecticide and fungicide which will kill the familiar potato bug as well as control the leaf blight. For a small potato patch pick the bugs off by hand.

Blight and rust are the diseases of celery. Control both by spraying with Bordeaux mixture. Hand-picking is the best way of getting rid of the celery caterpillar and this work may be supplemented by spraying with hellebore, in either powder or liquid form.

Lettuce diseases are best controlled by pulling out the affected plants; at least pull off the bad leaves and remove them from the garden and destroy.

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Trouble may be avoided by care in watering. Do not sprinkle the leaves themselves, as this is apt to cause mildew. For the lettuce louse sprinkle tobacco dust on the soil as close to the plants as possible. Persian powder, which is non-poisonous, may be used to get rid of the lettuce worm.

Consider cabbage and cauliflower together. Liming the soil and crop rotation are the specific precautions against club root, which causes the roots to swell and prevents the plants from heading. Black rot is also warded off by not planting where cabbage and cauliflower have been before. Another precaution is to soak the seed for a few minutes in a pint of water in which a tablet of mercuric chloride has been dissolved.

Various maggots, worms and beetles attack the cabbage. When the plants are young spray with arsenate of lead. Dissolve two ounces of the poison in five gallons of water. Later on dust with Persian powder.

Bordeaux mixture is the spray for the mildew that attacks the onion. A precaution against smut is to put a very light sprinkling of sulphur into the drill when the seed is planted. Small yellow insects,

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called thrips, sometimes attack onions. Tobacco dust will kill them.

Smut, rust and ear rot are the three diseases most prevalent in the sweet-corn patch. Use of hen manure instead of that from the barnyard helps some. Chemical fertilizer is still better. Plant the corn as early as possible and use ground that has not been in corn before for two or three years. When the silver-grey coloured lump appears on the stalk or ear, filled with black smut, cut it off and burn it. That is about as far as the experts have gone in arriving at the control of corn diseases.

These suggestions also have a bearing on the insect enemies of corn. The surest way of avoiding the worm already referred to on the ear is early planting. For the cutworm, which is a specially serious pest in dry weather, use poison on the ground near the plant. This refers of course only to the time when the corn is just a tender sprout and is in danger of being cut off at the ground, just as tomato plants are destroyed. A paste made of wheat bran and Paris green scattered on the ground will be taken as bait by the worms and that will end them.

CHAPTER VI



WATER WHENEVER NEEDED

IN each of the many public schools of the country that offer courses in practical gardening one of the leading questions on the final examination papers should be: "What would you do to save your garden in a drought that lasts a month or more?"

Ability to answer that question in a complete and lucid way should win for the pupil a very high mark from the teacher. Ability to live up to the answer in actual operations, if it should become general, would relieve gardening of its chief drawback, add very materially to the country's food supply, and put an end to the discouragement that is apt to come annually to all vegetable growers.

Of course the answer in its simplest form — so simple in fact that it does not explain — is "irrigate and cultivate." Cultivation with its dry-farming development is simple enough, whether it be

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with the hand rake and hoe or the larger horse-drawn substitutes for those simple tools. But irrigation is another matter. It is a process that ranges all the way from watering with a garden hose to the elaborate engineering projects of the arid sections of the country. In the Western and South-western regions of little or no rainfall the problem has been settled scientifically and adequately, because the absolute necessity of irrigation to make the land livable has been recognized.

In the so-called fertile regions next to nothing has been done, because the gardeners take chances — long chances — on getting their water supply in the regular way. But there is scant consolation, as you contemplate a burned-up garden at the end of a rainless July, to know that, according to the law of averages, you should have had so many generous inches of rainfall in that very month. That law is about as useful in a garden in a dry year as the law still on the statute books of New Jersey prohibiting a man in that State from kissing his wife on Sunday.

As a matter of fact the man who raises things on the reclaimed, irrigated deserts has a great advan-

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tage over the supposedly more fortunate grower elsewhere, who is at the mercy of the weather uncertainties — he can have his water whenever he wants it and in quantities to suit his needs.

That is just what you should have, no matter in what part of the country your place may be. If your garden is small, near the house and in a town with a public water supply, the hose will do the business, after a fashion, if you use it in a thoroughgoing way for real irrigation and not merely for a little namby-pamby sprinkling of leaves. In a long, dry season the man with the hose should direct his stream between the rows and put enough water into each aisle to flood it. Then the roots will get what they need. It is a long process, but one treatment a week of this sort throughout the continuation of the drought will save the garden, especially if the irrigation is supplemented on the next day by sufficient cultivation to cover the surface with a mulch.

But your garden may be too big for this irrigation by hand, or you may not have the city water supply. In place of that convenience, however, you have got a very real problem, the solving of which is interesting and yields as much satisfaction as the

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first-year gardener gets out of his first ear of corn.

The two main points of the matter are the source of water supply and the method of its distribution. If there is a small brook or running stream on the place, one that does not go dry in summer, a ram is about as simple a contrivance as there is for sending the water to a storage tank, from which the pipes or ditches may radiate over the garden or orchard or directly into the main trench across the highest level of the area, with smaller ditches running to the plant rows, carrying the water by gravity. Unless the garden is an absolutely level stretch of ground the gravity may be depended upon for doing a great part of the work of distributing, and the matter will be greatly simplified by planting the vegetable rows so they run up and down, rather than across the slope of the land. That, of course, is true no matter what the source of supply is.

If no stream or brook is available bore or drive a well at or as near the high point of the garden as a permanent supply of water can be found. Then install the pump. For a small place the ordinary hand pump is better than nothing and will justify the trouble of making the well. A double-action,

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hand force pump that will give a continuous stream is better still. It will give more water per minute and will also enable two persons to work at the same time on the handle, not only saving the garden, but affording wonderful exercise for the back. Best of all is a gasoline engine. A small one-horse affair of the farm type will cost considerably less than a hundred dollars, and before it is worn out it will save much more than a hundred dollars' worth of fresh vegetables.

For a garden of a half-acre or more such an engine would be a wise investment if the owner were determined to have it at its best and highest state of production, year in and year out, regardless of the lack of rainfall. The engine could also be utilized in a dozen other ways about the place when not in commission at the pump.

A fourth choice is the windmill. It costs more than the gasoline engine and there is no reason in the world now why one should be used other than the fact that it looks rather picturesque. With a windmill as the motive power of the irrigation system it will be necessary to have a storage tank to allow for the fact that there may be no wind at the time the

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water is most needed. With the engine the tank can be omitted, for the gasoline will work at any time and the water can be pumped directly into pipes or ditches of the distribution system.

On soils made largely of clay a good-sized stream of water can be carried a long distance in an open ditch. In sandy, porous gardens it will be necessary to send the water along in wooden troughs or pipes, with outlets that can be opened and closed when it is necessary to supply the various parts of the garden.

But the problem of distribution is a special one for each garden, depending for its solution on the character of the soil, the extent of the area to be watered, and the slopes. The one general fact that applies to all gardens is that a source of supply should be established at the top of the land. Get that first. The rest is best worked out by experimenting. Try the open ditches first. If they will not serve the purpose spend a very little more money and make V-shaped troughs out of old boards and then go on and improve the system by changes here and alterations there, a little each year. It is neither difficult nor expensive.

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The writer kept a half-acre garden green and thrifty through two consecutive dry seasons — in one there was a drought lasting forty-eight days — by a stream of water pumped by an engine that cost only seventy dollars new and is still rendering good service after five years, with not more than twenty dollars for repairs charged against it. The daily cost of operation was a shade less than a cent for gasolene and lubricating oil. Irrigation is only an occasional and incidental use of this machine. Its regular daily work is to pump water from a well to an attic tank to supply the dwelling house.

To harness it up for watering the garden it was only necessary to attach thirty feet of pipe that cost fifteen cents a foot, and send the water through that to a big wooden trough running across the top of the garden, with openings opposite the upper end of each row between the plants. That is about all there was to a very simple and inexpensive but useful irrigation system.

Spread the first cost over a period of a few years and it does not average more than the cost of fertilizers and seeds and plants. On the other hand it assures a supply of water to dissolve the plant foods

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that are in the soil, useless to the plants until they are dissolved, and to distribute these various chemical foods throughout the soil as well as putting them in available form for the roots to feed on.

Further than that the water holds in solution various soil acids that are necessary to the breaking up of the foods and it means life for the several forms of bacteria that are essential to plant life. Don't underrate water. If all the water needed for the production of a field of corn could be collected and impounded on the surface of that same field it would form a lake eight inches deep. Nearly every vegetable that grows in the garden would furnish equally striking evidence of the great value of moisture. The water required to produce a single hill of cucumbers would fill a half barrel.

Recent experiments have shown that the weight of beans grown on a small irrigated area was three times that of the weight of the bean crop grown on the same number of square feet in a garden near by, consisting of the same quality of soil. The seed was of the same variety and worth for both plantings, and the fertilization and cultivation were also the same. The very material difference was due entirely

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to the supply of water in one bean patch and the lack of it in the other.

But no matter how dry the ground may seem, no matter how many days have elapsed since the last shower, there is always some moisture in the soil. If you do not want to take the trouble to add to it and renew it by the artificial means of irrigation you must at least save what little there is by frequent cultivation. Water in the soil, whether it comes from below or from a recent rain, is always making its way toward the surface, where it evaporates and is lost, so far as the plants are concerned.

This escape is made possible by the capillarity of the soil — that is, the fine earth particles form themselves naturally into fine vertical lines and the water climbs these to the surface, just as water will climb up a towel, as you will see if you will dip the lower end into a bowl full of water. Of course if you cut across all the threads of that towel there would be no ladders for the water to climb on and it would all stay in the bowl. That is exactly what happens when you cultivate. You break those fine continuous lines of soil particles with the rake or hoe and the water stays beneath the surface, where the

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roots of the plants can get the benefit of it. But after a few days the capillarity of the soil restores itself by a natural process, and that must be offset by another cultivation. To express the fact in other words, you must keep constantly on the surface of the garden a mulch of dust, which acts as a blanket to keep the moisture in and may be the salvation of the garden during the dry weeks of August.

Do not get the notion that irrigation takes the place of cultivation. If anything it is the other way about. Water alone, whether supplied naturally or artificially, will not produce good crops without tillage. A well-cultivated garden will do better in a perfectly dry season than an entirely neglected garden in a season of normal rainfall.

CHAPTER VII



GARDEN MISTAKES OF VARIOUS SORTS

IF you have failed to plough or spade in the fall after the last flowers and vegetables have been gathered — an excellent thing for the soil — there may be some compensation in that very neglect. Fall ploughing buries what might serve as all-winter evidence of blunders that have been made and that evidence is a good thing to keep in view as a warning for the season to come. Those rows of wilted, frost-blackened vines and bushes, torn by the winds and unsightly with mud, tell a useful story. They show, for one thing, that some seeds were planted where others would have done better; that this plant had too much shade and the other not enough; that the sandy spot at the end of the garden was not put to its best use; that time might have been saved on cultivation had there been different grouping and classification in another section.

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In no enterprise of fun or business can the amateur make more blunders than in growing things. So the proper study of a gardener in winter is his old garden with its record of what should have been different. It is always in sight from at least one window of the house and the true enthusiast will wander into it whenever he can, between seasons, to plan for the new campaign.

These mistakes are not those of laziness or neglect but the less obvious errors that any one is apt to make until he has had the experiences of many summers, no matter how hard he works, no matter how free of weeds he keeps his patch. The books will not save him from all the blunders and the cultural directions of the seedsmen are not infallible because there were never two gardens just alike or that required the same treatment to get the best results. So for each and every flower bed and vegetable patch there must be built up a set of rules best adapted to it and based on the varying conditions of several seasons. In other words you must know your garden as the good skipper knows his boat or the skillful horseman his mount before you can get the largest response from its soil.

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The seedsman may tell you that carrots, parsnips and melons do best in sandy soil, but the seedsman cannot come out to your place and dig in your garden until he finds that at one end of it there is more sand in the loam than at the other end. You may hit upon the right spot by accident, but there is great danger you will plant those carrots where the celery ought to be, in the heaviest soil on the place, and vice versa. Then poor crops of both celery and carrots will be the first indication that something is wrong. You must find it out and make a shift next season.

The parsnips may be of excellent growth and yet not live up to their reputation as a table delicacy. Probably they were dug too soon. Parsnips should remain in the ground till after frost to acquire their best flavour. Another mistake to avoid this year.

Tomatoes need air and plenty of it, although the ordinary guidebooks never mention that important fact. So the amateur may follow every rule as to soil, distance apart and fertilizer for his tomato plants and then get unsatisfactory fruits because the plants are too near a wall of corn stalks that cut off the needed ventilation. If he avoids that difficulty

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he may neglect to cut out some of the too luxuriant leaf growth of the plant and the fruit will come to a poor end, smothered in its own foliage.

Eggplants and peppers need all the sun that is available; lettuce and peas want shade — two simple facts, the knowledge of which will mean better results for four of the vegetables indispensable in a complete garden. Put the peas and lettuce where they will get some protection from the heat in the shadow of the corn or the pole beans. Melons, cucumbers and squash must be in the open, where they may ramble at will without getting in the way of the bush plants and without having their own freedom curtailed. So it goes for every plant in the catalogue. No matter how small the garden or how few the varieties put in it, there is in that patch one spot better than any other for each particular vegetable. The problem is to find it, if not this year then next or the year after. It is one of the many puzzles that make gardening interesting as well as healthful and profitable.

In thinning out beets or lettuce after the first planting you may use the utmost care to have mathematically exact and equal intervals between the plants

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that are left and still not get the results expected. It is altogether possible that the roots of the plants that remained were too much disturbed and never had a fair chance to do their work of supporting the season's growth. That is a common error.

Another mistake and this one the winter evidence of the garden debris tells very clearly, lies in planting the same thing in the same place year after year. Rotation is as much needed in the kitchen garden as in the fields. No two things take the same chemical plant foods out of the soil in the same proportions, so a change-about gives the land a chance to recuperate each season from the effect of the chief drain on its resources in the year before. This year, for instance, plant the peas where the beets were last season and make similar changes throughout the garden. But avoid relocating things in spots that have proved unsuitable to their peculiar needs.

A different method of getting the benefit of rotation without changing the layout of the garden from year to year is to shift the soil itself. At one end of the patch dig a trench the full depth of the spade. Then shovel the next strip of earth into it, the third strip into the second trench and so on down

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the length of the patch, until you fill the last trench with the earth taken from the first. It is hard work but effective and, on a small area, worth while. Incidentally this process assures much more thorough breaking up of the soil than ordinary spading.

All plants need food and plenty of it, but no seed, when put in the ground, should come into direct contact with large amounts of manure or other fertilizer. Ignorance of this rule accounts for the failure of many vegetables to sprout.

It is, of course, needless to add that it is better to have no garden unless the gardener is willing to take the usual precautions against the worm and insect pests.

In the late Autumn sit down in a weedy, dried-out, neglected corner of the garden and make notes, not merely mental, but with pencil and paper, of all the evidence of blunders that lies spread out before you. Then, after putting down all you can actually see at the fag end of the growing season work your memory for material of an added record of all those early-in-the-season mistakes, evidence of which has been hidden by time and rubbish and weeds.

When you have finished you will have a chart of

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errors, a list of mistakes you do not want to repeat in next year's garden that will be as useful to you another spring as a chart of rocks and reefs is to the skipper making a difficult harbour. Just trying to remember all the blunders of omission and commission from one year to the next, without the aid of a record, will not do at all. You have made too many, unless you are the one gardener out of a thousand. A garden diary if religiously kept tells many a tale, and each tale should be a valuable lesson.

It will be altogether appropriate and also helpful to follow the botanical plan of classifying your wrongdoings in the garden under heads and subheads — the species and varieties, so to speak — in some such way as this:

SPECIES — NEGLECT

Varieties: Weeds; fungi; insect pests; water — too much or too little; failure to thin out; failure to pinch back; lack of tillage; lack of fertilizer.

SPECIES — FAULTY PLAN

Varieties: Running rows in wrong direction for easy cultivation; bad placing of plants with reference to their special needs for sun or shade and air and water drainage; bad placing of plants with reference to each other; placing of plants without due regard to their special soil requirements.

SPECIES — FAULTY TIME SCHEDULE

Varieties: Untimely planting for best results; too much or

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too little of one thing at one time; failure to provide succession; ignoring possibilities of companion cropping; too long intervals between harvesting of one vegetable and planting more of the same thing or something else on the same ground.

SPECIES — ERRORS OF JUDGMENT

Varieties: Wrong fertilizer or wrong use of fertilizer; using fungicide instead of insecticide, or vice versa, because of failure to understand the plant trouble to be cured; failure to watch weather to take advantage of its changes and to meet its emergencies.

Of course anybody can add to that list out of his own experience, but it will serve as a sample. Go through it again honestly, and see how many charges there are to which you yourself must plead guilty.

If you can plead not guilty to the weed indictment the chances are that you have a fairly good answer to some of the other charges grouped under neglect. For weeding in itself takes care very largely of the tillage or cultivation, except the preliminary preparation of the soil before planting. It also has helped materially in conserving the soil moisture during a dry season. But the hoe work and the barnyard or chemical manure have been time and effort and material gone partly to waste if insects or disease have been allowed the run of the garden. The size and the flavour of the melons have been considerably below what they should have been if the vines were not

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pinched off at the ends, and the size and quality of the tomatoes, the peaches and various other fruits have been below par if excessive fruits were not picked off in an early thinning-out process to give opportunity for a reasonable number to thrive and be properly nourished within the capacity of the plants.

The matter of too much or too little water is mentioned specifically under the general head of neglect. If there has been too much, if the seed has rotted in the ground or blight and mildew have ruined plants in places that were too damp, it simply means that your neglect to construct a very simple, inexpensive drainage ditch early in the season has rendered your garden or a part of it practically worthless.

If you have not had enough water, if in spite of all your mulching and dry farming with rake and hoe and cultivator to prevent surface evaporation the plants have suffered from lack of moisture, that has been your fault too. You cannot get a verdict of acquittal on that charge by pleading that there has been no rain. You should have irrigated. No garden is too small to receive that attention, without

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which it cannot produce, and no garden is located where some simple device cannot be arranged for furnishing water.

A little Paris green or some other poison mixed with bran and spread on the ground when you set out the young tomato plants would have prevented the loss of all those vines that were nipped off by the cutworms. A spray of more Paris green would have taken care of the potato bugs and given you a good crop instead of that patch of shriveled, leafless vines which you now have to record in your list of failures. Another half hour with the spray pump, filled with Bordeaux mixture, would have stopped the wilting of the vines and given you a crop of melons worth eating. And so on through the entire list of vegetables and the bug and fungous pests which attack them.

Perhaps you have been guilty of trying to run a garden without fertilizer. In that case you are sentenced to six months at hard labour of reading at least once a week the Government agricultural pamphlets on the soil's need of manure. That about winds up the various forms of neglect that can be put down in a general statement. Of course each indi-

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vidual gardener may have some secret form of foolishness or carelessness which he must remedy for himself.

The garden may be a difficult, irksome thing to work because of a faulty plan or no plan at all at the outset. If you begin haphazard, without a map, there is no limit to the mistakes you may make later in the season. Possibly the rows run the short way of the garden instead of the length of it, thereby materially increasing the trouble and time required for thorough cultivation. That, in nine cases out of ten, is only another way of saying that the thorough cultivation has not been given.

There may have been a map that was all wrong, a preliminary drawing full of laboriously worked-out blunders, such as putting the high-growing corn or pole limas up and down the east side of the garden where they would serve as a complete barrier to rob all the low plants of the much-needed forenoon sun. Potatoes may have been planted last spring where potatoes had been in the garden of the year before, and you have wondered all the season why disease has attacked the vines in spite of everything you could do to make them thrifty. Peppers that need

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much sun may have been tucked away in a shady corner where green peas and lettuce would have done well, even in the heat of the summer. Failure to learn at the outset whether there were any soil differences within the garden area, with reference to the amount of sand or clay or humus or moisture, may have been the cause of putting various things in the parts least suitable for them, whereas a different arrangement would have provided for each vegetable the conditions it most needed for good growth and abundant crop.

Avoid repetition of all this second group of mistakes, due to a faulty plan, by having an adequate garden map; by making use of the record of failures and successes of this year as a guide to what to do and not to do next time; by informing yourself as to the character of your own soil throughout the garden; and by knowing the particular requirements of each and every vegetable on your planting list, as to sun, moisture and soil texture and material.

Faults of a defective planting schedule are not so easy to avoid because the thing aimed at is to have just enough of each thing throughout the season, with sufficient surplus for the canning, preserving

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and storing for winter use. That is obviously a problem which must be solved for each individual by himself or herself with reference to many personal factors. You know what your own blunders of this sort have been if you have had periods of too much of some one thing or periods of dearth. One general rule to help remedy this trouble is to practise a little self-restraint at the very beginning of the planting season and then distribute your interest and enthusiasm for new plantings throughout the next four months.

Don't, for example, go radish mad in April and then forget to make the succession plantings of bush beans that are possible all through the season. Estimate as closely as possible the number of peas you will require at the outset of the cropping season and then plant just enough to supply that want, making a supplementary planting a week later, and so on throughout the season with all the vegetables for which there is time for two or more crops.

And in this matter of succession planting do not forget the possibilities of companion cropping—that is the planting of two things together in the same plat, one of which will mature quickly and be

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disposed of before the slow-growing companion gets to the stage where it requires all the plant food and moisture within the given area for its own use. Having a good schedule will not only furnish an even supply of food for the table but will enable you to get the maximum results from every inch of your garden.

CHAPTER VIII



TAKING PLANTING CUES FROM NATURE

Do not take the printed almanacs and seed-planting calendars too literally. In this matter the moderns, though they have done much to better some other things, cannot improve on the customs of the ancients. It is safer and saner, for example, to follow the good old rule of planting corn when the apple trees blossom than to plant corn, regardless of weather and soil conditions, on a day set down in a book that was written months before anybody knew what sort of season was coming. Furthermore the apple blossom and other homely suggestions apply wherever the garden happens to be, while the printed calendar has to be revised not only for weather but for every material difference in latitude or altitude.

This business of having a garden is, after all, an adventure with Nature herself and cues for its vari-

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ous processes must come from her to be reliable. There is no lack of them, from the flowering of the first wild violet on the sunny side of the road to the glory of the goldenrod. They are much more picturesque and fascinating than dates and are easier to remember.

So why not plant the peas and the onions when the peach trees put out their first blossoms or the new grape leaves begin to unfold? Try to get the beet seed in on the day the cherry tree bursts into bloom. Let the lilac and forsythia, the dandelion and the dogwood become associated in your mind, year after year, with some of the early garden activities and you will soon be independent of any man-made calendar and able to astonish your neighbour with expert advice, for your authority will be better than his. It is all right to plant at a certain fixed period in an average year as to weather and ground conditions, but if it is an unusual season, ahead or behind the normal, Nature's own signs will tell you when the books will not.

Keep a record, a garden diary, of all these things. Be as statistical as you like on the number of square feet you plant and the number of bushels or dozens

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you harvest and the estimated market value thereof. More important still, write down when and under what conditions of soil and weather you do things and what Nature is doing in her larger garden about you at the same time. It is that sort of a diary, kept through a series of years, that gives a man the real lore of gardens and makes him a true gardener.

In the greater part of the United States each square foot of Everyman's Garden may be made to produce two good crops within one season and there are a few combinations whereby a part of the garden may produce three crops.

But to get this maximum output from his soil and, incidentally, have a midsummer renewal of his early spring hopes and enthusiasms, the gardener must chart his ground and plan his time with the accuracy of a railroad time-table and then adhere as closely to the programme as weather and other conditions will permit. It is essential that the plan adopted in the spring be for all summer. The owner of the garden must know not only what and where he is going to plant first, but what and where he is going to plant three, even four months hence, and also what crop will follow another.

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Two bits of information are essential at the outset: What is the total number of days in any given part of the country during which plant growth may be expected — that is, what is the maximum interval between the last killing frost of spring and the first killing frost of fall, as based on averages of previous years for the particular region in which the garden is located? Second, what is the approximate interval for each vegetable between the planting of the seed and the end of harvesting the crop?

With these facts known, all sorts of combinations are possible in the way of rotation and succession. These two things are not exactly the same; at least there is enough difference to make explanation worthwhile. Succession is the planting of the same vegetable, peas for instance, on the installment plan — that is, one row on the first of April, a second row on the seventh, and so on. By this system the gardener will begin to have peas from the second row by the time he has gathered the last pod from the first, thus assuring himself of an uninterrupted supply all summer.

Rotation, on the other hand, would be the putting of beans or potatoes where the peas have been as soon

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as the planting of peas has yielded its crop and the vines have been pulled up. Both succession and rotation are necessary if the garden is to amount to all it is capable of.

According to the law of averages as applied to killing frosts there are two hundred and fourteen days of plant growth that may be depended upon each year in the temperate parts of the United States, beginning with April first and ending October thirty-first. There is no vegetable annual that requires so much of that time that there isn't time left for at least one other crop.

The chart at the end of this chapter showing how the same ground may be used to advantage two and three times, is based on actual performance in a commuter's vegetable garden in Middle New Jersey. Each of the horizontal sections covers one piece of ground in one season. All of the second-planting possibilities as enumerated in the sixth column of the chart have been tried out in different years with reasonable success. In only two years did the third plantings amount to anything worth while. But that does not affect the theory of the plan.

Of course the two sections taken for the chart did

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not cover the whole garden. There was corn planted elsewhere in May as well as the planting in June to follow the early peas. In still other parts of the garden there were varieties not mentioned at all in the chart. The illustration is given rather as an example of garden planning than as a guide of what seeds to plant. That must be determined by Everyman and his family according to their own vegetable likes and dislikes and their appetites.

Here are the planting directions and statistics relative to the time for maturity required by all the common vegetables, which will enable every gardener to make his own chart in advance for all of the coming season. They are grouped according to the months in which the first and successive plantings of each sort should be begun.

STARTING IN APRIL

BEETS — Plant in April, May, June, July. Seventy days to first of harvest. Thin out to four inches apart in the rows; rows a foot apart. One ounce of seed for fifty feet.

BRUSSELS SPROUTS — Plant in April, May, June. About one hundred and ten days to harvest. Plants two feet apart in rows, rows two feet apart. One-eighth of an ounce of seed for fifty feet.

EARLY CABBAGE — Plant in April. About one hundred and ten days to harvest. Plants two feet apart, rows two feet apart. One-eighth of an ounce of seed for fifty plants. It is

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better to buy the plants and set them out than to raise the cabbage from seed.

EARLY CARROT—Plant in April. About seventy-five days to harvest. Thin out to four inches apart, rows a foot apart. Half an ounce of seed for fifty feet.

EARLY CAULIFLOWER—Plant in April. About one hundred and twenty days to harvest. Plants two feet apart, rows two feet apart. One-eighth of an ounce of seed for fifty feet.

CELERY—Plant in April. Ready for use in October. Plants five inches apart, rows three feet apart. One-eighth of an ounce of seed for fifty feet of row.

ENDIVE—Plant in April, May, June, July. About eighty-five days to harvest. Plants a foot apart, rows a foot apart. Half an ounce of seed for fifty feet of row.

KOHL-RABI—Plant in April, May, June. Ready in about seventy-five days. Plants a foot apart, rows a foot and a half apart. One-eighth of an ounce of seed for fifty feet.

LEEK—Plant in April and May. Ready for use in one hundred and forty days. Plants six inches apart, rows a foot apart. Half an ounce of seed for fifty feet.

LETTUCE—Plant in April, May, June, July, to middle of August. Ready for use in eighty days. Thin out to eight inches apart, rows a foot and a half apart. One-eighth of an ounce of seed for fifty feet.

ONION—Plant in April and May. Ready for use in about one hundred and thirty-five days. Plants three inches apart, rows a foot apart. Half an ounce of seed for fifty feet. It is better to get onion sets—a pint and a half for fifty feet of row—put them out in the same month that you would plant the seed and at the same distance apart.

PARSNIP—Plant in April. Ready for use in four months, but is improved in flavor if left in the ground until after frost. Plants four inches apart, rows a foot apart. One-quarter ounce seed for fifty feet.

PEAS—Plant in April, May, June, July. Ready for use in

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sixty days. Plants two inches apart, rows two feet apart. Stake the rows with brush for the plants to cling to.

POTATOES—Plant in April and May—be sure to wait until ground is well dried out. Ready to dig in about ninety days. Plant in hills two feet apart each way. One peck of seed potato for every fifty hills.

RADISH—Plant in small quantities all summer from the first of April to the end of September. Ready for use in thirty-five days. Plants two inches apart, rows ten inches apart. Half an ounce of seed for fifty feet.

SALSIFY—Plant in April and May. Ready for use in about one hundred and sixty days. Plants six inches apart, rows two feet apart. An ounce of seed for every fifty feet.

SPINACH—Plant any time from first of April to the middle of September. Frost will not hurt spinach if it is covered with a little straw. Ready for use in about seventy days. Plants four inches apart, rows a foot apart. Half an ounce of seed for fifty feet of row.

TURNIP—Plant in April, May, June, July, August; some varieties may be planted as late as the middle of September. Ready for use in seventy days. Plants six inches apart, rows a foot apart. Half an ounce of seed to fifty feet of row.

STARTING IN MAY

BUSH BEANS—Plant in May, June, July, August. Harvest begins in about fifty days. Plants three inches apart, rows two feet apart. One pint of seed for every fifty feet.

LIMA AND POLE BEANS—Plant in May and June. Ready in about eighty days. Set poles three feet apart in rows three feet apart. A pint of seed for every fifty hills.

LATE CABBAGE—Plant in May and June. Harvest in the early winter and store in a good vegetable cellar or bury in a pit. Plants two feet apart, rows two feet apart. One-quarter of an ounce of seed for fifty feet of row.

LATE CARROT—Plant in May, June, July. About one hundred and ten days to maturity. Plants four inches apart,

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rows a foot and a half apart. Half an ounce of seed for fifty feet of row.

LATE CAULIFLOWER — Plant in May and June. Ready to use in one hundred and twenty-five days. Plants two feet apart, rows two feet apart. One-eighth of an ounce of seed for fifty feet of row.

CORN — Plant from the first of May to the middle of July. Harvest begins in eighty to ninety days. Plant in hills three feet apart each way. A pint of seed for every hundred hills.

CUCUMBER — Plant in May and June. Picking begins in about seventy days. Plant in hills four feet apart each way. Half an ounce of seed for thirty hills.

MELONS — Plant in May and June. Harvest begins in about one hundred days. Plant in hills four feet apart each way. Half an ounce of seed for thirty hills.

PUMPKIN — Plant in May and June. Ready in about one hundred and twenty days. Plant in hills five feet apart each way. Plant ten seeds in each hill, but pull all but the three healthiest-looking plants from each hill as soon as they appear.

CROOKED-NECK SUMMER SQUASH — Plant in May, June, July. Harvest begins in about seventy days. Plant in hills four feet apart each way. Half an ounce of seed for twenty-five hills.

WINTER SQUASH — The same time, distance and seed allowances as for pumpkins.

EGGPLANT, PEPPERS AND TOMATOES — Buy the plants and set them out in the latter part of May. Tomatoes and eggplants three feet apart each way; peppers two feet apart each way. The harvest should continue through the greater part of July, August and September if the right assortments of early and late plants are obtained. To raise these three plants from seed they must be started under glass in March.

A GARDEN TIME-CHART

VEGETABLE	DATE OF PLANTING	DAYS TO BEGINNING OF HARVEST	DAYS OF HARVEST	DAYS RE-MAINING	SECOND PLANTING POSSIBILITIES	DAYS TO BEGINNING OF HARVEST	DAYS OF HARVEST	DAYS RE-MAINING	THIRD-PLANTING POSSIBILITIES
Peas . . .	April 1	60	10	144	{ J'ne 10. Bush Beans or Corn . . . or Potatoes . . . or Brussels Sprouts or Melons . . . or Late Cauliflower	50	14	80	August 14. Lettuce, Corn Salad, Radish or Carrot September 10. Radish, Turnip or Spinach September 10. Radish October 10. Nothing September 30. Nothing October 15. Nothing
Bush Beans	May 1	50	21	113	{ July 11. Beets . . or Late Carrot . . or Corn . . . or Cucumber . . or Endive . . . or Lettuce . . . or Peas . . .	70	5	38	September 24. Radish Nothing September 14. Radish, Turnip or Spinach

CHAPTER IX



APRIL—THE FIRST WEEK

HAVE you an accumulation of the winter's wood ashes and are you doubtful as to the best use to which they may be put in the garden? The strawberry bed is hungry for them. They will renew the soil's supply of potash and that is a good plant food for fruit.

Rake in the ashes now, or as soon as the ground is rakable, and there will be better and larger berries and more of them in June. Even a few pounds of ashes scattered over an area of twenty square feet will be effective, but choose a still day for the work, because this fertilizer is too useful to be wasted by being blown away.

Strawberries do not require more plant food in the long run for all the various stages of their growth than other products of the garden, but they want most of it in a comparatively short time, be-

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cause the interval between the start of the spring growth and the fruiting is brief. The making of the berries is a terrific strain on the plant and it must be helped. To appreciate what the help means, compare the diminutive wild strawberry that grows by the wayside without care and the wonderful cultivated berry of the garden.

This cultivation of the strawberry has been going on now for 260 years and fertilization has been one of the chief factors in its development. So no gardener should neglect his own patch. As already said, the wood ashes will provide the potash. A small quantity of bone meal — say, a pound to twenty square feet — will give the soil what phosphoric acid is needed for the plant and even less nitrate of soda will provide the needed nitrogen.

These chemical fertilizers are much easier to handle than barnyard manure, quicker in their beneficial effect on the plants and cost less unless you happen to have a horse of your own or a horse-owning neighbour who has no garden.

But if the soil of the strawberry patch is thin — that is, lacking in decomposed vegetable matter — it is better to use the barnyard manure either as a sub-

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stitute for the chemicals or in addition to them. Only the old manure that is thoroughly rotted should be applied, however, as that fresh from the stable may be full of weed seeds, and no plant is so helpless against weeds, so quickly and easily throttled out of existence, as the strawberry.

If there is no strawberry bed on the place already one should be started in April if the ground is sufficiently free from moisture and in good working condition. Buy only new plants, less than a year old, from first sets rooted from runners. One hundred plants altogether, including the early and late fruiting varieties to give a succession, will make an ample patch for one family and from this nucleus the gardener may go on, year after year, getting new plants from the runners of the old and shifting the location of the patch every second year at least, to get the best results.

This shifting is to avoid the dangers of plant disease from using the same ground for the same thing too often. In the case of strawberries the bed may be allowed to shift itself in this way: Each plant puts out one or more runners and from the end of each of these which goes into the ground a new plant

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starts. By placing the ends of these runners just where the new plants are wanted a new row may be grown parallel to the old one and far enough away from it to escape any dangers there may be in the ground from the old plants. The following season, after the space of the first row has been thoroughly cleaned, the process may be reversed and the runners trained back to the original row.

For a new patch select ground that has been under cultivation during the previous year or two. Soil in which corn or beans or potatoes have grown is best. Avoid sod land by all means, unless it has had a great deal of white clover growing with the grass; otherwise the newly turned-up ground is apt to be filled with worms and other pests fatal to good strawberry growth.

There is no way of getting much fruit this summer from plants set out this spring. But if you wait until fall the crop of next season will not be so abundant as from plants set out now. One season's preliminary work without fruit is worth while for a first-class bed. There are two good ways of planting. The first one is to make a hole big enough round to hold all the roots freely spread out like the

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ribs of an open umbrella. Then take the plant by the crown between the thumb and finger, twirl it till the roots spread and drop it into place. Planted in this manner every root is sure of opportunity to do its work and get its share of moisture and plant food out of the soil.

In purchasing the plants, by-the-way, pay more attention to their roots than to their leaves. An abundance of the former is what is wanted. If the leaves are too thick it is even well to pull off a few of them to reduce the foliage surface through which the moisture can evaporate above ground, robbing the roots.

The second method of planting is quicker and accomplishes the same thing. Shove a spade into the ground the full depth of its blade and then push the handle over, making a V-shaped opening in the ground. Spread the roots of the plant fan-fashion and hold them against one side of the V while the earth is pulled back against them by thrusting the spade into the ground just beyond the first opening and pulling the handle toward you. This method also assures the proper contact of each root and rootlet with the earth.

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Let that earth be a sandy loam if it is available. That is the ideal soil for strawberries, although with proper treatment they will grow almost anywhere.

If there is plenty of room that can be devoted to the berries, set them out in hills with rows three feet apart and the same distance between the plants. That allows of more thorough cultivation and gives each plant a larger share of the moisture and richness of the soil. Naturally the berries are larger, richer in flavour and more attractive in shape and colour. But planting that way is a luxury.

The usual method and, if space is limited, the only sensible way is to plant in rows. Begin by putting the plants in a single row, twelve inches apart. Have a space of four feet between the rows at the outset, for part of that ground is to be filled in with new plants from the runners of the old. Let these runners take possession of the ground for a foot on either side of the original row, making altogether what is known as the matted row. Then in turn the runners from this can have the ground still left and, as soon as this last set of plants is established, the original row, which has produced fruit for two seasons, can be dug up.

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This renews the bed practically within the same part of the garden originally devoted to it, and the patch may be worked back and forth within that area for years if enough fertilizer is put on and if sufficient care is taken to keep the ground free from pests. One precaution is to cut off all the old leaves as soon as fruiting is over, for on this dead foliage the injurious insects find their best breeding and hiding places.

Also at the end of the fruit production, the plants are usually in great need of weeding and cultivation. The earth has been packed by the daily pressure of the shoes of the berry pickers and it is just the season when weeds are making their greatest strides toward taking possession of the garden. Loosen up the ground thoroughly and get rid of all vegetation that does not belong there.

All strawberry plants do not produce perfect flowers — that is, flowers with both the male and female organs for propagating themselves — so in every patch there must be some perfect plants that the pollen from their stamens can fertilize the other plants. At least one-fourth of the patch should be of the perfect plants scattered among the others.

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A mulch must be put on in the fall and kept on through the winter. It serves as a protection from the cold and so prevents, in great measure, the alternate freezing and thawing of the ground and the consequent heaving of the plants and tearing of the roots. In the spring the leaves or straw of this mulch retain the moisture in the soil and also prevent the weeds from starting. Of course they answer the same purpose all through the season, and when the berries begin to ripen and bend the vines with their weight the mulch keeps the fruit from the ground and thus saves many berries from spoiling before they can be picked.

But it is an excellent thing to take this mulch off at least once in the spring, give the ground a good cultivation with the hoe and then rake the straw back, taking care to leave the plants themselves free.

CHAPTER X



APRIL—THE SECOND WEEK

Two vegetables that Everyman likes to have on his table, in season and out, but which, strangely enough, are seldom found in Everyman's Garden, are asparagus and celery. Why does the average amateur leave them out of his plan? Probably because growing them carries him a little beyond the primary stage of planting something as simple as the squash or beans, and because in things agricultural, more than in anything else, matters that he does not know about seem too technical and difficult for a layman to undertake.

But the difficulty begins to disappear as soon as an actual start is made to have celery and asparagus in your own garden. The beginning for both plants should be made within the first half of the month of April.

The only objection to asparagus is that you have

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to wait so long for results — two years if you set out one-year-old roots and three years if you start with seed. But the use of the ground is not entirely lost, for while Everyman is waiting for his first crop he can use the space between the asparagus rows for other vegetables.

Against the single disadvantage of the long wait there are many things on the other side. Asparagus comes earlier in the season than anything else. It is very prolific, and it loses very little of its flavour and succulence in being canned in the home kitchen for winter use. There is much to be said in its favour as a very wholesome article of food. The ancient Romans used it as a medicine. And — this is the main thing — nothing is more palatable.

Asparagus is one of the most easy-going, least exacting plants in the garden. It will grow and even produce fairly good crops on almost any soil if it has proper cultivation and enough fertilization, so very few gardeners can plead unfitness of ground as a sufficient excuse for not having a bed of "grass."

But, as with everything else, there is the one ideal sort of soil best adapted to this particular plant, and that one is of the light sandy variety, reasonably rich

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in plant food. Furthermore it should be free of stones and old roots and all other rubbish that might get in the way of the tender sprouts shooting their way toward the surface.

Sunshine, and much of it, is absolutely essential, so in selecting the site for the bed attention should be given not only to the character of the soil, but to the surroundings. No trees, bushes or fences should be near enough to throw any shadows on the surface of the bed. On the other hand there must be some protection from north and east winds. This is best obtained by planting on ground with a gentle southerly slope — due south if possible. This slope not only serves as a protection from the north wind, but affords the maximum amount of sunshine. Another device to get the full benefit of the sun's warmth in early spring is to run the rows north and south.

Everyman is justified in hiring a ploughman for the main work of making his asparagus bed even if he does dig all the rest of the garden himself. Of course he can make the asparagus bed with his spade if he wants to be very thrifty or has a notion that as a matter of sentiment he wants to be able to look upon his finished garden and declare proudly that he

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did every inch of it himself. But the sentiment must have the energetic support of a good strong back in this case, and two or three dollars would pay for all the work that the man with the plough need be called upon to do in the preparation of this part of the garden.

In either case it is necessary to have a trench a foot deep and at least a foot wide at the bottom, so the many roots radiating from the crown of each plant may be spread out well and lie in a natural, uncramped position from the outset. The old method was to dig the trench a foot and a half deep and fill in the bottom to the depth of six inches with barnyard manure, cover that with a thin layer of earth and then put in the roots. But that is unnecessary and a waste of time, energy and manure, because the scientific agricultural experts have demonstrated that the feeding roots of the asparagus plant extend laterally rather than downward and get little, if any, benefit from fertilizer placed beneath the crowns of the roots — a demonstration for which the man who is to do his own work of spading should feel very grateful to science.

The length of the row of course depends on the

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space in the garden that may be devoted to the asparagus bed. Roots should not be set closer than eighteen inches apart, and two feet should be the minimum distance between the rows. If there is plenty of room in the garden the distance between the rows may be increased to advantage. However a strip ten feet by thirty—that is, five rows, each thirty feet long—would afford space for one hundred roots, an ample patch for the family. If not more than half that space were available it would still be well worth while to start an asparagus bed.

Good one-year-old roots may be bought at the rate of seventy-five cents a hundred. They will furnish all the asparagus, cut fresh every morning during the season, that the family can use, with some left over for canning. A single bunch of asparagus costs about twenty-five cents at the store.

A new crown grows each year a fraction of an inch above the old one, so the underground system of the plant is coming nearer the surface all the time. As an asparagus bed is good for a dozen years or more sufficient depth must be allowed at the outset. The only objection to deep planting is that the crop is not so early in the first few years, but that can be

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offset in part by hoeing out between the rows early in the spring so the sun's heat will penetrate to the roots more readily and start them into quicker action. After growth starts the earth should be raked back where it belongs, making the surface of the entire bed level. Ridging up must be resorted to if it is Everyman's fancy to raise white asparagus, as the earth banked against the spears is what bleaches them. For green asparagus this is not necessary.

To get something from the ground while waiting for the first yield of asparagus there is no harm in planting some such plant as the pea or bean between the rows, especially if enough ground is used to make that space three or four feet wide. This will not hurt the asparagus roots in the least; on the contrary it will be a good thing, because the presence of the peas or beans will assure more thorough cultivation. Asparagus, like everything else in the garden, needs a lot of care and the more the bed is hoed the better. Also it needs an ample supply of plant food or fertilizer. If barnyard manure is used, as it certainly should be for at least a part of the fertilizer, be sure it is old and thoroughly decomposed. If it is fresh it will be too hot, and the young spears coming

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up through it will rust. Supplement the barnyard manure, thereby decreasing the quantity of it necessary, by adding wood ashes which are rich in potash.

If these are not available buy a little muriate of potash from the seedsman. By the ton it costs forty-five dollars, so in small quantities it should not cost more than three or four cents a pound. Five pounds would be ample for the small asparagus bed when used in addition to half a load of barnyard manure. To get a perfectly balanced fertilizer for asparagus it would be well to add ten pounds of phosphate. This costs only about a third as much as the potash. For the necessary nitrogen it is safe enough to depend on the supply of nitrate contained in the manure itself.

A third possibility is to use chemicals altogether in alternate years, or oftener if the soil is already sufficiently supplied with humus or organic matter such as the straw and other decomposed vegetable portion of the manure. This suggestion is offered because it is so much easier to obtain and handle the chemicals, and so much less in bulk is required. Every seedsman carries a special mixture adapted to

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the requirements of each variety of plant, and if you find you can depend upon him for good seed you may take it for granted that his chemicals will be honest too.

The time to fertilize is in the spring and summer during the growth of the stalks after the cutting season. It is then that the crowns are forming the new buds from which the edible sprouts of the next season will come, and therefore it is then that the roots need and assimilate the food needed for those sprouts.

Apply the fertilizer as a surface dressing, not directly on top of the rows just above the line of crowns, but on either side. Work most of it into the soil by raking, but leave some of the manure on the surface to serve as a mulch to block the weeds and prevent the evaporation of moisture.

In the first two years of bearing do not cut the spears for the table for more than three weeks. After the bed is well established and thrifty the daily crop may be taken for six or seven weeks. When the season for cropping is over the tops will quickly develop into high, bushy plants and go to seed. Wait until the berries are fully coloured, then cut everything down clean, burn the rubbish to get rid

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of insects and disease germs, and that finishes the business of the asparagus bed for the year.

A fungus disease, called rust, and the beetle are the two chief pests that attack asparagus. To combat the rust, spray with Bordeaux mixture, with Paris green or arsenate of lead added, as soon as the cutting season is over, and clean up the ground very thoroughly in the fall so as to destroy any infected plants and leave no place for pests to winter. To get rid of beetles and grubs, dust with fresh lime when the morning dew is on the plants. If you have chickens turn them loose in the patch and they will make short work of the insects.

BEST SOIL FOR CELERY.

To produce celery in the greatest abundance, on a market-garden scale, for example, the black boggy soil known as "muck" is best; but to produce the plant in small quantities, say an all-winter supply for the family, a moist, sandy loam, even a soil with lots of clay in it, is better than the muck, because celery grown in loam has a finer flavour and keeps better. Fortunately Everyman's Garden is more apt to be of sand or clay than of muck.

The time for beginning out-of-door celery work,

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either with seed or with plants purchased from the seedsman or home-grown under glass, is April. It is not too late now to start with seed for next winter's supply or even for the Thanksgiving dinner. But for an early-fall crop the plants must be purchased in April, if you have not raised them yourself. Set the plants six inches apart in rows that are three feet apart. If seed is used there must be some preliminary work to get good results. In the first place do not select celery seed as one of the things to economize on. Do not get the cheapest sort in the catalogue, but the best, not only because of the quality of the plant it will produce but for the greater assurance that it will grow. The seed of this plant, which is a biennial, producing seed the second season and then dying, loses its vitality very quickly. It is a waste of time, effort and ground space to plant seed more than a year old.

But even good seed must have the best possible conditions under which to begin growth. The following instructions apply to the preparation of the soil, whether the start is made with seeds or plants:

If the soil contains much clay break it up and improve its texture by spading or ploughing in a lot of

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barnyard manure. A wheelbarrow load for every twelve feet of row is about right. If the soil is thin and sandy use barnyard manure, too, to furnish the required humus. Of course this manure will furnish fertilizer as well as improve the mechanical condition of the soil, but for a quicker-acting plant food, one that will begin to serve the plants from the very outset of their growth, get some chemical fertilizer, which may be purchased in small quantities and costs but a few cents a pound.

Potash is the main thing. A mixture containing two pounds of potash and a pound each of nitrate of soda and phosphoric acid will properly enrich two twenty-foot rows. Work it in thoroughly over a strip about two feet wide, down the centre of which the plants are to be set out at six-inch intervals. This fertilizer may be used in addition to the barnyard manure, or without it if the soil is sufficiently supplied with humus.

Another ingredient that will help — it is very necessary if the ground is sour — is lime. As already explained in the third chapter of this book, the test for sourness is very simply and accurately made by a bit of blue litmus paper that the druggist sells

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for a few cents. Touch the paper to the moistened earth; if it turns red the ground needs lime. Another trick that is practicable in a small garden and is worth trying is to sprinkle salt along the row and work it in — about a pint to every twenty feet. This will be absorbed by the celery plants and their flavour improved by it. After growth is well under way add a little nitrate of soda along either side of the row and rake it in.

So much for the things that should be added to the soil. Fully as important is the working of it into proper texture. Let the preliminary spading or ploughing be deep enough to assure a layer of five inches of well-pulverized soil when the preparation is completed. Rake or harrow both ways after the digging and repeat the process as often as may be — the more of that the better — and put on the finishing touches by smoothing with a board. For the seedbed itself put the surface soil through a sieve with a reasonably fine mesh.

Seed may be sowed broadcast in the preliminary bed and when the plants appear three weeks later, perhaps a little sooner than that, they can be thinned out so that each remaining plant will have sufficient

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room to make the first month of its growth. After that comes the transplanting to permanent rows. This extra work of shifting the plants from one place to another has a very definite purpose in the care of celery. The plant if left to itself puts down a very long taproot and almost no lateral-growing roots, which are necessary to produce the most desirable plants. Transplanting serves to break that taproot and then, in the new bed, the lateral growth begins and makes up for the loss. Of course, you can get celery without transplanting, but the other way is much better. The seed, which is very small, should be covered as lightly as possible.

Showery, misty sort of weather is the best for seed-planting or setting out and transplanting, and if you can hit it just right to do the work between two gentle showers an excellent start will be made. When transplanting dig up the seedlings in such a way that the earth will cling to the roots. Moisture is essential. To make sure of it firm the soil well about the plants and then cover with a mulch of loose dry earth, of straw or old leaves or manure. The manure is best, but care should be taken to keep it, as well as all other dirt, out of the heart of the

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plant itself. Sprinkle the mulch and let the water percolate through to the soil and then to the roots. This should be done after sunset. Don't overdo this moistening, however, for that would cause what is known in celery as "damping off." No artificial watering should be given after the crop has got a good start.

Deep cultivation after the plants have started must be avoided, for those lateral roots, already referred to, grow very near the surface and must not be disturbed. A shallow-working scuffle hoe is a good tool for the weeding and a light raking is sufficient to keep the surface of the soil fine and loose and therefore a bar to the evaporation of moisture.

Blanching of celery is not a difficult or a mysterious thing at all. Nevertheless it is the barrier that needlessly keeps this very desirable plant out of so many family gardens. It is an added process, something different from the simple picking of other vegetables, and so the amateur is apt to hold the mistaken notion that celery raising is only for the professional.

Blanching of the celery is not primarily to make it white, although that, too, is an advantage, but rather

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to improve the edible quality of the plant. Wild celery is a tough plant with woody, fibrous stalks of rank flavour that nobody would care to munch. Somebody once discovered, probably by accident, that excluding the light from the plant did away with this woodiness and produced the crisp, tender celery that is so appetizing. Incidentally the exclusion of the light prevents the plants from becoming green, as darkness always destroys the natural colouring matter of leaves.

This blanching part of the work may be done with boards or earth equally well. If boards are used get old ones, as new lumber is apt to give a disagreeable flavour to the plant. Tilt the tops of the boards toward each other as far as the tops of the plants will permit, thus forming an A-tent-like contrivance, open a little at the top. The upper edges can be held together by nailing bits of lath across. Throw some earth against the boards on the outside to prevent light from creeping in through the cracks under the bottom edges.

Another excellent way — the best way for a small number of plants if Everyman wants to spend a little money to get perfection — is to use short

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lengths of earthenware pipe, the ordinary farm-drain tile, with an inside diameter of four inches.

Slip a tile over each plant, after it is nearly grown, something like a flower vase without any bottom, with the top leaves projecting in a green bunch and the stalks whitening below entirely out of the light. Use the unglazed pipe for this purpose, because the rapid evaporation from the dull surface keeps the inclosed plant cool and crisp and gives you a ripened product that is unsurpassed.

The simplest, cheapest way is to bank the stalks with earth, after tying the leaves together, not too tightly, so that the growth will be compact and as a precaution against dirt getting into the heart of the plant and rotting it. Banking with earth requires spade work for the most part, but there should be some heaping up and patting by hand to see that all the outer surfaces of all the stalks are covered.

Do not try to use straw or leaves for blanching purposes because they are in a constant process of decomposition and may rot the celery. They are sure to give it a musty, disagreeable flavour.

The winter supply may be kept where the plants are grown by covering sufficiently with earth, with

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some manure over that, to keep out the frost. Then dig it out, a bunch or two at a time, as it is needed.

One of the commonest diseases of the celery crop is "damping off," caused by a fungus that attacks young plants and rots them at the point of contact with the earth. Careless watering at the outset is the cause of this. One effective way of avoiding the trouble is to start the seed in shallow boxes instead of in the open ground. Bore a few holes in the bottom and set the box in a tray of water. This assures the roots of plenty of moisture without danger of rotting or damping off the young leaves.

Prevention rather than cure must be provided against celery blight because if it gets a start, as it is apt to in long-continued hot, sticky weather, the plant will droop, just as humans do in the same sort of weather, and either die or grow into a very poor quality of celery. Spraying with Bordeaux mixture containing a weak ammoniacal solution of copper once a fortnight will ward off this disease.

Grasshoppers, celery caterpillars, celery-leaf tiers, and the tarnished plant bug are the insect enemies. The tiers are a double nuisance, not only eating the leaves but spinning webs about them. The tiers and

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caterpillars are best destroyed by hand-picking. Paris green, mixed with bran and scattered on the ground, will put an end to the grasshoppers.

THE RAISING OF ONIONS.

Onions raised this summer will cure all of next winter's colds, tone up the family health in general and be an important and pleasing addition to the food supply, so they should find good room in Everyman's Garden.

There are several "don'ts" that apply to this vegetable. In the first place it is not a rugged garden pioneer, ready to thrive, as corn or potatoes would, on newly turned-under sod. For that reason put the onion row where there was a hoed crop last season. But do not put it where onions themselves were for this is one of the vegetables that must have rotation to save it from disease and insects.

Composition of the soil is not so important as its mechanical condition. Sandy loam is best, but onions may be raised profitably on heavy clay soil if a lot of decayed leaves or barnyard manure is worked into it to break it up and make it more porous. If your garden happens to be a piece of old, reclaimed

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swampland, where there is a muck soil, you can raise onions there, too, after thorough cultivation and an application of lime and potash.

Let the preparation of the ground be sufficient to give a four-inch layer of well-pulverized earth, as smooth and free of weeds and rubbish as if you were preparing a seedbed for flowers. If this soil is well supplied with humus substitute commercial fertilizer for manure. Any mixture sold for potato fertilization will do, but a combination specially adapted for onions can be made at home for very little money.

Get half a pound of sulphate of ammonia, two pounds of muriate of potash, four pounds of acid phosphate, and a pound of cottonseed meal. Mix them well with a hoe and rake into the ground. Two pounds of such a mixture would be ample for two fifty-foot rows of onions.

It is simpler for the amateur to buy sets — a pint of reds and a pint of whites make a good combination and will be enough for two thirty-foot rows. The sets cost about thirty cents a quart. Place them three inches apart and there should be a foot between rows.

If seed is used, an ounce, costing from twenty to

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thirty cents, will be sufficient for one hundred feet of planting. Cover the seed with half an inch of soil. Sow thickly and thin out to three-inch spacing after the plants have started.

CHAPTER XI



APRIL—THE THIRD WEEK

THERE are so many excellent reasons why the amateur gardener should raise his own small fruits as well as his vegetables that it would take too much of his time from out-of-door work to read them all. He had better read briefly how to raise the fruits — and then get at it. So to save time the reasons may be grouped as economic, gastronomic and æsthetic.

As to the first, fruit costs more at the store than vegetables, and it costs almost as little to raise. Fresh fruit is not only a delightful but a most healthful thing for the family to eat in abundance. If it has been raised in some other man's garden there is very little freshness about it after it has reached your table by way of the commission man and the retail dealer. And, æsthetically, fruit is the one thing needed to make Everyman's Garden beautiful, to give tone and colour to the vegetable patch, while the

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growing of it is about as interesting a part of his enterprise as Everyman can tackle.

Also it is easier to keep the women of an average family enthusiastic about the garden throughout the season if there is fruit in it. It appeals to their love of colour and their feminine weakness for desserts. Many a daughter who would scorn to hoe the potatoes would like nothing better than to be caught with a camera while picking rich red clusters of currants.

So much for the reasons for having a fruit garden. Now for the facts. If possible select a part of your garden that has a good loamy soil for the fruits. If the soil is not right you can do a great deal to make it so by plenty of cultivation and the digging in of barnyard manure. The best way, practically the only safe way, is to plant the fruits on ground that has been used for at least one year for vegetables—such crops as corn or potatoes or beans that have been well hoed. This assures the fruit of soil that is rid of the annual weed seeds and the perennials, such as the various kinds of grass, and that is also comparatively free from insect larvæ. It also provides soil that is mellow from cultivation.

If you have your choice between a piece of ground

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that is light and sandy and another that is heavier because of the presence of clay, give the brambles — that is, the various kinds of raspberries, the blackberries and dewberries — the sandy place and put the currants and gooseberries where the clay loam is, for such is the ideal arrangement so far as soil character is concerned. But that is a fine point which should not cause any loss of sleep or time in getting ready to set the fruit out. For the bush fruits will thrive in almost any soil if they are set out properly and get decent care thereafter. Lack of moisture is one of the few things that bush fruits will not stand. Neither will they stand an excess of moisture. Standing water on the surface is fatal; so is a soggy, wet soil down about the roots, so drainage is an important matter to look after. Fortunately it is a very simple one, so don't spoil what might otherwise be a very good fruit patch by failure to dig a drainage ditch if it is needed. A short line of drain tile may prove a good investment.

The more time and care devoted to the preparation of the soil now the better will be the fruit crop, in quantity and quality, when the bushes come into bearing. If you are very particular and very deter-

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mined to have about the best fruit garden in your neighbourhood you will resort to the extreme method of trenching the ground to a depth of two feet.

That means digging a trench two feet deep at one end of the fruit garden, taking the earth to the other end, then digging another trench beside the first, shoveling the earth into the first, digging a third and putting the earth into the second, and so on away across the patch selected for the fruits. The earth that has been taken from the first trench at one end finally goes into the last trench dug at the other end, thus completing the process.

The result of all this is to give you a deeply dug and thoroughly stirred soil in which the roots will have the very best opportunity for growth. Of course if you find a stratum of pure clay or sand a foot or so down you will not bring it to the surface. In that case shift the topsoil for as great a depth as it is good and treat the subsoil by breaking it up and working into it a lot of manure. For that matter some manure of the well-rotted sort should be worked into the whole bed, topsoil and all. The only excuses for not using barnyard manure liberally in the preparation of the soil is that the soil may be well sup-

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plied with humus at the outset and that chemical fertilizers are to be applied later as the more convenient way of enriching the soil after the plants are established.

It would be useless here to recommend particular varieties of bush fruits. Selections should be made with reference to the family's likes, in accordance with Everyman's knowledge of what has done well in the neighbourhood, and with the advice of the nearest reliable nurseryman. Furthermore, names mean much less as applied to bush fruits than they do in the case of trees. There is, for example, a late-fruited variety of raspberry which an Eastern nurseryman has exploited of recent years under a very highfalutin name at fruit shows and in catalogues and for which he has charged a very stiff price. But that very same fruit, under various commoner names, is to be had from nurserymen throughout the country at a much more reasonable price. So the best way to order your plants is to describe to the dealer just what you want and then trust to his honesty.

The dewberry is one of the brambles that may have a place in the fruit garden, but go light on that. It isn't much of a fruit at best, is an uncertain pro-

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ducer, bears a small fruit and a big thorn that makes working about it rough and painful. Its only advantages are that it bears earlier fruit than the blackberry bush and will grow on the poorest sort of soil. One or two bushes, for the sake of the experiment and to have the satisfaction of a full fruit list in the garden, are about all that you should fuss with. Put the plants three feet apart.

Blackberries require more room than anything else in the bush fruit plantation. They make the best showing when planted in hills six feet apart each way, but that requires more room than is available on the small place without crowding out something else equally good. Give each plant four feet, and if possible have them in rows six feet apart. Or they may be planted in double rows one foot apart, six feet between rows. They should be planted early in the spring. Set the roots in the soil four inches deep and cut the tops down to within a foot of the ground. For the first year do not allow more than five new canes to grow, and after that determine the number solely by the character of the growth—that is, cut out all that are not healthy and vigorous in appearance. Get rid of the superfluous suckers as they

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appear. Remove the old canes and cut back the branches for half their growth each spring. The plants should yield good crops for seven years or more if they receive proper care.

For the raspberry follow the same methods as for blackberries, except that the spacing should be three feet between bushes and four feet between rows.

Currants and gooseberries may be considered together so far as their needs are concerned. Get two-year-old plants, with plenty of good roots, and plant them early in the season. Both these berries require heavier, moister soil than the blackberries, a fact to be remembered in planting the fruit garden if the patch offers any variety of soil. Space the currants and gooseberries the same as raspberries.

Prune in the fall or early the following spring, taking out all the old branches and whatever new ones do not look promising, and cut back any growth that seems to shoot up too fast and get ahead of the average development of the entire bush, for the plant should be kept symmetrical. Cultivate with great care near the plants, for the roots grow very close to the surface, so the hoe, if used too vigorously, will cut them off.

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All these bush plants may be had at the rate of a dollar a dozen or less.

Have the ground prepared before the plants are delivered, either by the trenching method or by a thorough spading, supplemented by a fining of the surface soil with the rake. Also have the holes dug at proper intervals, big enough so that the roots may be well spread out, without any twisting or cramping.

If there must be some delay between the arrival of the plants and their setting out see to it that they are heeled into moist ground — that is, bury the roots temporarily in a trench to prevent their drying out. This precaution will go a long way in the starting of healthy plants. Another device that will help in the same way is to dip the roots in water or, better still, in thin mud before planting. This will assure good moisture at the start and hasten the process of becoming well rooted in the new ground. Cut the bushes back at planting time, and before cold weather sets in cover the ground with a heavy mulch of straw or manure to prevent the heaving of the soil and plants by alternating thawing and freezing.

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Through the summer watch the leaves of the currant bushes. If they blister and shrivel up and turn red look on the under sides and you will probably find a lot of green lice. Dissolve a pound of whale-oil soap in five gallons of water and spray the foliage, being sure to get the mixture on the under side of the leaves where the lice are. Another remedy for currants is spraying with a strong solution of tobacco extract.

The midge and the gooseberry fruit worm attack gooseberries, causing them to drop from the vines. Spray the bushes, as soon as the fruit begins to enlarge, with Bordeaux mixture or the summer dilution of lime-sulphur — that is, one to thirty — with half a pound of arsenate of lead dissolved in every fifteen gallons.

Examine the raspberry canes very carefully through June and July to guard against the cane borers. Cut off all damaged or withered tips below the point of trouble. Above that point there is probably a borer inside. It is in June that the beetles girdle the canes, making two rings about an inch apart, between which they lay the eggs that produce the borers.

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That is about all there is to the process of starting the plantation of bush fruits; but remember that you have got something that will become nothing more than a thorny nuisance and waste of ground if you do not take care of it in the seasons to come. It will require cultivating and fertilizing and irrigating just as much as the vegetable garden, and when the proper time comes the puzzling question of pruning will have to be tackled.

By the term "small fruits" is meant the bush or vine growing berries — blackberries, raspberries, currants and gooseberries. The strawberry bed is considered separately in chapter nine. Technically grapes are not included in this classification, but Everyman surely should include them in his garden and directions for starting the vines are in chapter twenty-seven.

Here are chemical fertilizing formulas of trifling cost, easy to obtain and mix, for the bush fruit garden. They are figured for a patch twenty feet square. A little arithmetic will enable the amateur gardener to get the proportionate quantity for larger or smaller areas:

CURRANTS AND GOOSEBERRIES — One pound of nitrate of

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soda, two pounds of bone meal, a pound and a half of muriate of potash.

BLACKBERRIES — A pound and a half of nitrate of soda, four pounds and a half of bone meal, a pound of muriate of potash.

RASPBERRIES — One pound of nitrate of soda, six pounds of bone meal, two pounds of muriate of potash.

CHAPTER XII



APRIL—THE THIRD WEEK,
CONTINUED

ABOUT this time of year a tree agent will rap at your front door and urge you to buy fruit trees. The probability is that he is honest, believes what he tells you about the excellence of his wares, and is trying to make a living. But be firm and send him away without an order, or if he overcomes your judgment give him a small order and when the trees come cut off the roots and use the tops as brush for your pea vines. Don't set them out for fruit-bearing purposes in the years to come.

When rid of the agent go to the nearest nurseryman who has been established in the business a long time and buy your trees direct of him, after telling him just what you want and getting his personal assurance that what he sells you is true to name or type, that it is free from disease, and that it comes from good-bearing stock.

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It helps to do this even if you are an amateur and obliged to depend upon the word of the grower. It is not so much a question of the honesty of the nurseryman as of his interest. The honesty can be taken for granted, but he will use more care in selecting for you after a personal talk, and this method is surely worth the time and the carfare you put into it. As for the cost, the price you will pay for a single tree or by the dozen is much less than what you would have to pay the travelling agent, who frequently knows nothing about trees.

Remember that in setting out fruit trees you are embarking upon a venture that will last for years. It is much more serious than planting a row of corn—hence the necessity for Everyman's starting right on his miniature orchard of one or a dozen trees.

It is taken for granted that he will in the course of his gardening pass through the small-fruit stage, and after establishing his berry patch will begin to think of trees. He ought to anyway.

If he has plenty of room the standard trees will do. If space is limited there are the dwarf trees, taking up very little room, bearing much sooner

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than big trees, and yielding, in some cases, a better quality, though the same variety of fruit that the standards bear.

So far as apples and pears are concerned it is safe to say that the dwarf trees will better meet the requirements of Everyman and his suburban property than the big ones. But he may have the Baldwin or the Northern Spy or any other variety that he may desire just the same. A dwarf fruit tree is simply one that has been made up by the combination of a scion from a tree bearing the sort of fruit desired and a root of some slower-growing tree.

For instance the nurseryman gets his dwarf pears by taking a scion from an ordinary or standard pear tree — Bartlett or any other variety — and grafting it on a quince root. The union between the two is perfect. The slow-growing quince root will never allow the pear top to reach regular pear-tree size, but the fruit will be of the same size and always true to type.

The dwarf apple, for the purposes of the commercial nurseryman, is obtained as a rule by grafting the various scions of standard trees on the roots of the Paradise apple.

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One great advantage of the dwarf apple tree to Everyman, who may want to be a real farmer and move to a bigger place eight or ten years from now, is that it will bear in two or three years, whereas fruit cannot be expected from a standard apple tree inside of seven years. This material shortening of the waiting period applies to all dwarfed trees.

Stunted peach trees, only waist high, that look more like bushes than trees, and bear wonderful fruit, are obtained by grafting on plum roots. An even more diminutive peach tree is had by using the root of the dwarf sand cherry. This dwarf sand cherry is also the root used in making vest-pocket plum trees.

Dwarf pears of nearly all the popular varieties can be bought of any first-class nursery for twenty or twenty-five cents each, with material reduction on lots of ten or more trees. The same nurseryman probably will sell you dwarf apples at twenty-five cents a tree.

These two — apple and pear — are the only fruits that the American nurserymen have so far made a business of dwarfing. To get the peaches and plums in the stunted form requires something of a

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hunt or a little experimental work with grafting on your own account.

Among the obvious advantages of this dwarf fruit is the ease in getting at all parts of the trees, without the aid of poles or ladders, to prune and spray and pick the fruit. Furthermore the trees may be shaped and trained almost as readily as a grapevine or a wistaria. Pears and peaches can be made to grow against a wall or trellis at the end of the garden. Dwarf apples, kept down to single stems or cordons and allowed to go straight up or bent into horizontal growth, can be converted into a perfect fruit-bearing screen. Apple trees grown in this fashion may be set as close as two feet apart. Apples allowed to take bush form will thrive with only seven-foot intervals. And the same is true of all the other dwarf fruit. So no matter how small his space Everyman may have some sort of an orchard.

As to soil requirements, the need of careful cultivation and pruning, and the absolute necessity for spraying, the rules for the dwarf fruit plantation are practically the same as for the orchard of big trees.

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Perhaps you own the place, have lots of room, expect to live on it all your life and leave it to your children, and have an old-fashioned notion that an apple tree should be big enough to hang a swing from and that fruit tastes better and more natural if you have to climb for it. In that case two or three different varieties of apple trees, standard size, a pear, a cherry, a plum and a quince, and three or four peach trees, early, medium and late varieties, are what you want. Standard trees live longer than the dwarfs.

The most successful orchards are those grown on former forest land. That is not so hopeless a statement for Everyman as it sounds at first, inasmuch as many a suburban place is on the site of what was timber land a generation ago.

But to be more specific, the peach does best on sandy loam, the pear and apple prefer a clay loam, and the plum will grow in heavier soil than any of the other fruit trees. Nevertheless all these fruits will thrive, especially in small, well-cherished family orchards, on any reasonably good soil, so the naming of the ideal conditions need not deter Everyman whose place does not quite measure up to them.

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One old-fashioned notion that must be discarded at the outset is that fruit trees will take care of themselves when once stuck into the ground, that an orchard needs no cultivation, and that for some queer reason the land selected for fruit growing may be expected to produce its crop and a crop of grass or weeds or vegetables at the same time. That is all wrong, but it is the one fallacy — next to the one that hens need only corn — that the average farmer is most persistent in sticking to.

Prepare the ground in the first place as carefully as you would that of the vegetable garden, only plow or spade deeper. Cultivate the young orchard until the middle of August and then sow crimson clover in it, to be ploughed under next April. This is to stock the soil with humus or rotting vegetable matter and to furnish an ample supply of nitrogen for the wood growth without paying the price of expensive commercial nitrates. For the rest of the fertilizing use manure and wood ashes or some other supply of potash. Without potash there can be no fruit.

If there is any difference in the lay of the land give the apple trees the coldest, most exposed posi-

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tions and the peaches the warmest and most sheltered.

Apple trees — we are not talking about the dwarfs now — should be twenty feet apart. The rule for a commercial orchard is forty feet, but in the back-yard plantation, where there will be plenty of individual care for each tree, closer planting may be allowed and the trees can be pruned so they will not interfere with one another. The peaches should have at least twelve feet, as against the fifteen or eighteen of big plantations.

At the nursery get one-year-old trees, true to name and of good shape and size. Have the ground prepared and the holes dug before the trees arrive so there will be no delay during which the roots can dry out. If it is not possible to plant as soon as they come lay them in a trench and cover the roots with moist earth.

Pruning is a problem that lasts all through the life of a fruit tree, but it is never more important than when the trees first arrive from the nursery. In digging them out of the nursery rows some of the larger roots have been broken and many of the fine feeding roots and rootlets have been torn. This is inevitable, but it does no harm if the knife is used

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skillfully. There has been no corresponding damage to the top part of the tree in the digging at the nursery, so, as received by Everyman, the tree is out of balance—too much branch to be supported properly by the remaining root system at the beginning of growth in his orchard. So the main stem of the tree must be cut down—to two feet for peaches and plums; to three feet for pears and apples. Furthermore the side branches must be trimmed off—cut off entirely on the new peach trees and to within a few inches of the main stem on apples and pears.

This cutting back of the main stem is not only to relieve the roots of too much strain, but also for the all-important forming of the head of the tree and determining its future form. The lower that head is formed, the easier it is going to be later on to gather fruit, to spray and to prune the tree. Also the tree is going to save itself by its own shade from the dangers of sun scald, and it is going to be better prepared to stand up against heavy winds.

Do not leave more than four side branches; three are better. They should grow, of course, in differ-

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ent directions and should not start from the same level on the main stem. If they do the danger of splitting off under pressure of wind or the weight of a big fruit crop is greatly increased.

The roots must be pruned too, to the extent of cutting off all broken or torn ends. Then see to it that the roots left are well spread out in the hole. Hold the tree upright as well-pulverized earth is shovelled back into the hole and joggle it up and down so that the soil will fill in all the cavities and crevices about the roots and rootlets. There must be no air spaces left. As each tree is thus set, firm the soil about it with your foot, just as you would firm the earth above a row of garden seed, and then scatter over the top a handful of loose soil to form an earth mulch to keep the moisture underground about the roots where it belongs.

Pruning and spraying — two very essential operations in the successful growing of tree fruits — are usually associated with the idea of cold weather, as the work is best done in the dormant season. That is true enough of the heavy pruning and reforming of trees and of the spraying for scale, which unfortunately is the only spraying many fruit growers

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seem to think is necessary. But much effective work can be done in June with both knife and pump.

For the knife, however, substitute the thumb for the greater part of the cleaning on small fruit trees. Simply rub off the new leaf or tender sprout as soon as it shows on trunk or branch at a point where new growth is not wanted. A minute or two of thumb pruning on each young fruit tree now and then in the summer effects two great economies — it saves hours of heavy pruning with knife or shears next year when the sprout has developed into a branch or twig that is not wanted and, what is more to the point so far as the welfare and future productivity of the tree are concerned, this getting rid of unnecessary growth at its very start saves energy and plant food to go into the development of the wood, foliage and fruit that are wanted. For example, the so-called suckers that grow on neglected fruit trees, sapping their strength and yielding no return, would never come if the summer pruning was as thorough as it should be.

This applies particularly to the apple and peach trees. It is seldom the custom to prune cherries or plums in summer and they require very little cutting

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in winter; but pears are apt to throw out suckers that should be cut off.

With the peaches and apples the thing may be overdone. On trees set out this spring it is better, perhaps, to eliminate the summer pruning altogether, provided the trees were properly cut back and trimmed when they were set out. The young trees need about all the foliage they can produce to supplement the work of the new root system in giving the whole plant a good, first-year start. But here again the amateur, wrestling with his first fruit-tree problem, must use some judgment. Suppose, for example, the new tree is making good growth in leaf and new wood at the top and a branch starts out from the trunk at the ground, as frequently happens. It is obvious that that branch should be cut off, because it will simply be a nuisance later on.

At the end of the first year's growth take a two-foot rule and measure all the new twigs on your young peach tree. If they total up three hundred or four hundred inches there has been good, healthy development, indicative of proper care and fertilization and correct soil conditions. In the second year thumb pruning may be freely indulged in, and much

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done by it toward shaping the tree as it should grow — opened up enough inside to let the sunlight reach all the fruit to colour it, not too high for convenience and thoroughness in spraying and for ease in picking, and without horizontal branches so low or far-reaching as to interfere with thorough cultivation close to the tree. These suggestions apply to the small fruit plantation as well as to the large commercial orchard.

Winter spraying of fruit trees, as already said, is primarily for the San Jose scale, although it helps the general health of the trees. It should be done with lime-sulphur in the proportion of one to nine — that is, in every ten quarts of the applied mixture there should be nine quarts of water and one quart of the lime-sulphur.

Then comes the blossom spraying to get rid of the curculio. This should be with a solution of arsenate of lead in water, in the proportion of a pound of the lead paste to sixty quarts of water. Apply this to peach and apple trees when the petals are falling.

Aphids or plant lice are best controlled by a spray of kerosene emulsion — a useful thing to use for

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various troubles of fruit trees, including the pear tree psylla in June. You can make this for yourself very easily. Take half a pound of fish-oil soap — formerly known as whale oil — and dissolve it in a gallon of water. Then put it with two gallons of kerosene. Ordinary stirring with a stick will not cause a sufficiently thorough and even mixture, but this difficulty is overcome by pumping in a lot of air and churning the soap water and kerosene together. Take an ordinary bicycle pump and put the end of the pipe into the liquid.

Scab and brown rot, which attack plums, apples and peaches, can be controlled by summer spraying with Bordeaux mixture or the kerosene emulsion. Brown rot also attacks the cherry and this tree should receive the same treatment.

A beetle, light brown in colour and about a quarter of an inch long, called the quince curculio, attacks the fruit for which it is named. It punctures the fruit, making it knotty and wormy. Spread a sheet on the ground under the tree and then shake the tree. Many of the bugs will fall on to the sheet so they can be gathered up and destroyed. The spray remedy for this quince-tree trouble is Bordeaux

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or arsenate of lead, the same proportions as given above for peach and apple, used after the fruit is set.

For leaf spot and fruit rot of plums spray with Bordeaux, not only when the blossoms fall but again when the fruit is about two-thirds grown. Even then there is bound to be some spoiling of the fruit, especially in a season of much muggy weather, because the plum is the most difficult of all the tree fruits to pull through in good condition.

For tree fruits dig the following fertilizer mixtures into the soil within a radius of four or five feet about the trees:

For apples, pears and quinces — one pound of nitrate of soda, seven pounds of bonemeal, two pounds of muriate of potash.

For cherries and plums — half a pound of nitrate of soda, five pounds of bonemeal, one pound of muriate of potash.

For peaches — one pound of nitrate of soda, four pounds of bonemeal, two pounds of muriate of potash.

Take a look at the map of the United States and see where your garden is with reference to latitude. If you are south of the thirty-sixth parallel the pos-

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sibilities of your fruit plantation are greater than those of your brother gardener farther north. You can amuse yourself by trying unusual fruits. There is the pawpaw for instance. It is a low-growing tree of beautiful foliage, has large purple-and-white flowers and bears a very aromatic fruit, which you do not like at first but take to later on. This fruit thrives best in rich, moist soil. It has to be propagated from seed, as any other method is uncertain. Juice of both fruit and leaves makes a fine sauce that is much relished when used with meats.

The loquat will grow down South, too, all through the Gulf States. It is a tree that ordinarily attains a height of about ten feet, blooms anywhere from August to December and matures its clusters of yellow, pear-shaped and very acid fruits in the spring.

Persimmons may be made to grow in the open as far north as the thirty-eighth degree of latitude. Plant the seeds in the fall just as you would plant a peach pit, and transplant the young trees the following fall. The persimmon requires a warm soil of good loam.

The pomegranate, not hardy north of the thirty-

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fourth parallel, may be propagated from hard-wood cuttings placed in the open ground in February or from new wood cut and planted out in the summer. This tree will do as well in a hedge as growing by itself, and thus serve the double purpose of decoration and fruit producing.

CHAPTER XIII



APRIL—THE FOURTH WEEK

FAILURE to make lettuce head up is one of the most frequent causes of disappointment in the small garden. Selection of the right variety and the observance of one or two very simple principles of vegetable growth will overcome the difficulty. There are numerous varieties that will form compact, cabbage-like heads and have white, crisp hearts under proper conditions.

Every seed grower and experimenter in plant propagation is at work on the problem all the time to get new sorts. Sometimes they will advertise them and boom them too soon, before the habit of the variety is so firmly established by several generations of even performance that even the amateur cannot fail. So it is much better for that amateur, especially in the matter of lettuce, to stick to a standard variety, something that all the seedsmen put well toward the

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top of their list and, when you pin them down to it, recommend with even more assurance than their own pet specialties.

One such standard is Big Boston, a lettuce variety that can be recommended by any disinterested guide to the amateur because all seed stores have it. It is the one variety that the writer has never failed to head in several different kinds of soil. It is the lettuce that the United States Government, through the Department of Agriculture, talks about as the surest sort to form a close head. Furthermore it is the best to raise from seed planted in the open ground, the custom of most amateurs, without the aid of glass or transplanting from a preliminary seedbed.

So if you failed last season try Big Boston this. With the right sort planted, the next thing to bear in mind is that lettuce to be well grown and to make good eating in the salad must be quickly grown. It should be ready for the table in eight or nine weeks. That means plenty of moisture and an abundance of plant food and good cultivation very frequently. Supply the initial store of plant food by spading a liberal amount of black barnyard manure into the ground before planting. If the soil thus enriched is

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sandy loam you have the ideal combination, but other kinds of soil will do.

Pulverize the ground thoroughly with the spade and then the rake and finally a smoothing board before planting the seed. If the bed is to be small, and you just want to lay yourself out to produce the best possible lettuce, put an inch or two of the surface soil through a fine screen. Have the rows a foot apart and mark them for the planting with the point of a stick so lightly that the depression will be hardly noticeable. Drop the seed in an even line in this shallow drill and barely cover. The first leaves should show within a week. At the end of the second week thin out to about four-inch intervals. As soon as it is possible to determine which are the best plants thin again to one foot intervals so that the remaining heads will have plenty of room and plenty of food.

After the lettuce is well started the growth may be quickened and a crisper, more tender crop obtained by supplementing the manure already dug into the ground by a little of nitrate of soda. A couple of ounces sprinkled along a twenty-foot row of plants and lightly raked in, or the same amount put in a gallon of water used for sprinkling the ground be-

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side the plants after sunset will do much good in forcing development. Similar results may be obtained, though not quite so quickly, by scattering a shovelful of hen manure along the row, close to the plants but not touching them. Rake this in. The nitrate or hen manure is nitrogen feed and lettuce is one of the few things with which this particular form of fertilizing is not so apt to be overdone. Nitrogen makes wood in trees and foliage in plants, rather than fruit, and as the leaf is the only part of the lettuce that is wanted the more of it the better. With peas or beans, on the other hand, too much nitrogen would give very luxuriant growth of deep green leaves and very few pods.

Frequent cultivation of the lettuce is very necessary, not only to keep the weeds out but to save the moisture for the roots just below the surface.

Lettuce is a cold-weather plant at its best, but with proper care may be grown in succession throughout the season. Muslin screens placed above the plants in the heat of the day during the hottest part of the season will help a great deal. An incident of a recent winter's remarkably mild weather and an indication of the hardiness of lettuce was the growth

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of this plant in the writer's open garden in middle Jersey as late as the end of January. This, of course, was accidental. Plants which had seeded themselves from the late fall crop had come up and survived what little cold there was so well that they were transferred from open ground to a cold-frame.

Another convenient thing about lettuce is that it fits so well into a companion cropping plan. Such a scheme is the planting of several different vegetables at the same time on the same patch of ground, the arrangement being to select things that require short, medium and long periods for coming to maturity. All sorts of combinations are possible in this companion cropping, by which ground space is saved and the same cultivating is made to serve for more than one crop. Here is just one for a sample:

Plant early cabbage and lettuce in a row with ten inches between plants, and the two kinds alternating. Ten inches from the first row plant a row of radishes, ten inches beyond that another of alternating lettuce and early cabbage plants, and so on till the ground available for the combination patch is occupied. The radishes will mature and be out of the way before they can become a drain on the other

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things and the lettuce will be out of the way next, leaving the cabbages in sole possession of the patch when they are maturing.

This same thing is done by orchardists on a large scale when they set their new apple trees forty feet apart and set peaches between. By the time the apple trees need all of the land the peach trees have finished their work and can be pulled out. There is no reason in the world why Everyman should not do the same thing in his garden.

Lettuce is almost immune to insect pests or disease. About the only thing that ever attacks it is the plant louse. You can get rid of that very easily by dusting the plants with tobacco powder. Use a powder sprayer or bellows.

Human beings have been eating cabbage, to the advantage of their health, for at least four thousand years. Everyman should keep up the record for his own family by having a patch in his garden. Near by there should be some of the allied plant, the cauliflower. These things are very similar in their requirements and so near alike in their make-up that somebody once described a cauliflower as a cabbage that had had a college education. To start in April

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to get early cabbage or cauliflower it is necessary to buy plants started under glass in February. For next winter's supply of late cabbage the seed may be sown in the open ground at any time through May or June throughout that wide belt of the United States which may be roughly described as within the latitude of New York or Philadelphia. About the first "don't" for the amateur to observe in selecting the place for his cabbage is don't put it where cabbage was last year. It is subject to more vegetable ills than you can shake a stick at, and the germs of these diseases linger in the ground from one season to the next and may ruin this year's crop even if the trouble was not in evidence last season. Sour soil — that is, soil with too much acid in it — is very sure to make trouble, especially by bringing about the club root, the worst of the cabbage diseases.

First see if the soil is sour by squeezing a piece of blue litmus paper in a moistened lump of earth. If it turns red the acid is there. Work a pound of lime into every twenty-foot row of the garden.

To avoid black rot it is well to soak the seed for fifteen minutes in a solution of formalin just before planting. An ounce of formalin in a gallon of water

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is the right proportion. Insect pests that prey upon cabbage plants may be controlled by spraying with kerosene emulsion.

For fertilizer for cabbage and cauliflower there is nothing better than old barnyard manure. You can hardly have too much of it. If it can be ploughed and spaded under some time before the seeds are planted or the plants are set out so much the better, for it should be thoroughly worked in, and both the soil and the manure should be made fine by frequent tillage so that the plant-food ingredients of the manure will be available for the roots from the beginning of growth. It is a good thing to supplement the manure with a few cents' worth of chemicals. For the early cabbage use nitrate of soda for the same reason that you use it on lettuce—to quicken leaf growth.

Cabbage and cauliflower rows should be at least twenty inches apart, even in a small and crowded garden where the ground area does not match the ambition of the amateur. Two feet is a better distance. Plants in the row should be the same distance apart as the rows, and late varieties need more room than the early ones.

CHAPTER XIV



MAY—THE FIRST HALF

If all the water needed to bring a good crop of corn to maturity on a certain field could be collected and held on the surface of that field it would make a pond eight inches deep. This applies to your own small patch of sweet corn as well as to the farmers' fields of many acres in the Corn Belt. The fact was demonstrated at the Illinois Agricultural Experiment Station to convince corn growers that their crop needs a great deal of moisture.

In spite of this, one grower in Pennsylvania, who has such a record of corn successes that they are a matter of official comment by the Government, raised one of his good crops in a year when there was no rainfall between planting time and harvest.

These statements may seem contradictory to the amateur gardener who wants to raise some sweet corn for his own table, but they are not. They prove

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first that the corn must have moisture, and second that if it doesn't come from the sky direct it must be, and what is more important, can be furnished in another way. The Pennsylvania farmer got his good crop in the dry year by much cultivation, working constantly to conserve what little moisture there was in the ground and to keep it down near the roots where it would serve the purposes of the plant.

That is the lesson for the amateur. He must hoe. The hotter and dryer it is the more he must hoe, for heat makes corn grow so fast that you almost can see it, and that steadily increasing height of stalk puts a tremendous strain on the root system, which must have its water supply if the cobs are to be well filled out with big, juicy kernels.

Also the roots must have an ample food supply if they are to furnish a food supply for the garden-er's table through July and August and September. Of the plant-food elements needed by all vegetables the two that figure most prominently, perhaps, in the case of corn are potash and nitrogen. Both these can be bought of the seedsman, together with the needed phosphoric acid in the shape of some commercial fertilizer that is specially adapted to

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corn. The nitrogen is supplied in this case by nitrate of soda, which is the most expensive of all the agricultural chemicals. If you keep hens by all means use some of the manure from the poultry yard for the corn patch. It is the richest fertilizer there is so far as nitrogen is concerned. Pulverize it, mix it well with fresh soil, and work it into the hill or drill where the corn is to be planted.

Fresh hen manure unmixed with earth must not come in direct contact with the seed or the roots of the corn plant, because it is so rich that it would destroy them. Barnyard manure is the best all-round fertilizer for corn, as for everything else, if it is entirely free from the germs of diseases that attack corn. It is dangerous in that respect, so if your corn-patch soil is well supplied with humus—that is, decayed vegetable matter, old sods and the like—it does not need the breaking up process that comes from digging in a lot of coarse manure, and it is best to use the chemical fertilizer from the store or supply the ingredients in part with the droppings from the henhouse. Wood ashes form an adequate home supply of the potash.

Twenty-five pounds of commercial chemical fer-

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tilizer on a patch twenty by thirty feet — six hundred square feet — is a generous supply, and if that amount is reduced or increased in proportion to the size of the area devoted to corn the crop will not fail from lack of plant food.

Newly spaded or ploughed-under sod makes the ideal plat for the corn, especially if the earth is sandy loam. The second choice, if you have no new ground left in the garden area, is the patch where peas or beans were last year. On the other hand, the location of the corn must be considered with reference to the rest of the vegetables. The northern end of the garden is best, so the shade from the tall stalks will not dwarf the other plants that must have their share of the sunlight.

Cross breeding by the falling of the pollen from one variety of corn on the silk of another variety should also be taken into account. If you plant the seed of a Baldwin apple or any other variety, or the seed of a particular sort of peach, there is no telling what sort of fruit you will get from the resulting trees. The same is true of corn. No matter how carefully selected the seed may be, it will not reproduce its own variety throughout the crop if

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another kind of corn is too close. The resulting crop may be just as edible — perhaps more so if the varieties that cross are both sugar corn. But don't make the mistake of trying to raise a little chicken corn for your own poultry in the same garden with the sweet corn. If you do that you may have to feed the whole crop to the hens.

The ease with which corn pollen is blown from one stalk to the silk of another makes this plant one of the few with which the amateur may experiment in crossing and get results that are worth while. It will add greatly to his interest in his garden as something more than a source of food and a place for healthy exercise. He should at least do something in the way of producing his own corn seed for the following year. Watch the development of the different stalks, the time of tasseling, the amount of pollen and the quantity and quality of the silk. Then mark the plants which show the best growth in every respect and leave on them the perfect ears to ripen for seed purposes. Hang them from the ceiling of a dry room where the mice cannot reach them. Half a dozen good ears will furnish all the seed required for the ordinary family garden.

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Soil preparation must be thorough. Tillage should consist not only of turning over the seedbed with plough or spade, but also of pulverizing the new surface with the rake or harrow. This is to conserve the moisture by the means already referred to and to break soil lumps into small particles from which it is easier for the plants to draw their food supply.

Planting in hills or drills is largely a matter of fancy, although each way has its enthusiastic advocates who will not admit there is any merit whatever in the other. This is one of the things each amateur should decide for himself after trying both methods, one this year and the other next. Then he will join the hill crowd or the drill crowd and be a trifle cranky about the matter ever afterward. But that is part of the fun of gardening — breaking away from the books and having real opinions of your own.

Distance apart of the plants in drill or row and the distance apart of the hills should be determined in part by the variety of the corn. Seed of the early, low-growing varieties may be put as close as eight inches in the drill, with thirty inches between rows. Hills for the same sort of corn should be two feet

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and a half apart with the same distance between rows.

For the main or late-crop, tall-growing varieties increase all these intervals. Let the plants in a row be ten inches or a foot apart, with three feet between drills, and let the hills be three feet apart each way—four is better if you have the room. For the row planting the distance suggestions are for the plants allowed to grow. It is well to plant thicker than that at the outset, as a precaution against the toll taken by birds or cutworms and plants lost in other ways, and then thin out if too many of the plants survive.

For the same safeguarding purposes plant five kernels in each hill and then thin out to three plants. Many gardeners try to raise four stalks in each hill and get fairly good results, but the experience of the writer in his own garden is in favour of three plants to a hill for the best returns in quality and quantity. To carry out the suggestion to save your own seed it is not a bad plan to have some hills with only two plants each, so that the corn saved for reproduction may have the very best chance for complete development. Plant the seed about an inch deep.

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Tillage before planting must be supplemented by frequent cultivation afterward to keep the weeds out and to have at all times an earth mulch of loose, dry soil on the surface to cut off the evaporation of moisture from below. In the small corn patch this mulch is best obtained by the use of the hoe, which cuts out the weed growth at the same time better than a rake can. Be careful, however, not to cut off a root, for when a corn plant loses a root it immediately sets to work to grow a new one and that means so much energy diverted from the business of sending up the stalk and producing the ear.

Succession in the corn crop may be obtained by planting early, medium and late varieties at the same time, or by making successive plantings of the same early variety at one-week intervals. The advantage of the first method lies in the fact that the best corn — that is, the juiciest, on the largest ears — is of the late varieties such as Stowell's Evergreen and Country Gentleman.

BUSH AND POLE BEANS.

String beans, the ordinary six-weeks bush variety, are the real benefactors of Everyman and his gar-

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den. They will grow almost anywhere; they will make poor soil better by merely growing in it, because they take nitrogen from the air and add it to the reserve supply in the earth. They are prolific, can be had in unbroken succession from early summer to frost-time — a movable date — and there are few things that ever interfere with the crop in the way of pests or diseases.

Nevertheless the bean is worthy of Everyman's best care and its easy-going qualities do not mean that the seed should simply be thrown on the ground and left to take a chance. Plant the ordinary string beans early in May, unless your garden is so far north or so far down east in New England, that you are in danger of frosts after the middle of May. Planting of the limas may be postponed until the end of the month as an extra precaution.

Although, as just admitted, beans will grow almost anywhere, a sandy loam is best. A light sandy soil is best for the limas. Pulverize the ground well before planting and be generous with the barnyard manure. Do not use hen manure unless you want to raise luxuriant bean vines with no beans on them to speak of.

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Make the drills for the seed two inches deep and drop the seed two inches apart. The plants will grow and do well as close as that, but better results will be had from thinning out to four inches after the second week of growth. Use the ground sparingly for the first planting. Plant a second lot two weeks later and so on until the end of August or later. One row thirty feet long is enough to plant at a time for a family of four persons.

For the pole limas plant in hills at least two and a half feet apart — three feet if you have plenty of room. Plant five seeds to a hill, two inches deep and with the eyes up. After you are sure three of the plants are going to survive pull out the other two. Use poles with the bark on, as the rough surface gives the tendrils of the plant a better clinging and climbing chance. Cedar poles are best.

In preparing the hills it is an excellent thing to remove a shovelful of earth, throw in a shovelful of manure, cover it with two inches of earth, plant the seed, and cover with two inches more. The seed should not come in contact with the manure, but it means good growth to have that supply buried there.

CHAPTER XV



MAY—THE SECOND HALF

No time will be saved by trying to rush the season of planting melon seed in the open ground. Not only must the danger of frost be entirely gone, but the soil must have had time to warm up before receiving the seed.

Starting melons under glass is almost never tried by the amateur. It is not suggested to him in his seed catalogues and the seedsmen do not start and sell the plants as they do tomatoes. Nevertheless this method for getting an early crop is resorted to by commercial growers in many parts of the country where the season is short, and is, of course, the regular practice in Canada where the bulk of the famous Montreal melon crop is raised for the market. So there is no reason why Everyman in his small garden should not take a hint from the professional grower

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to prolong the fruiting period of one of the most delightful things he can possibly raise for his table.

It is safe to begin melon planting out-of-doors by the middle of May as far north as latitude 41, except in regions where, because of altitude or other peculiar local condition, there is risk of later frosts. But if Everyman happens to have his garden up near the northern edge of the country let him start his seed in a cold-frame or protect the hills in the open garden with glass boxes.

The boxes can be bought at an implement store, or they can be made easily by the gardener himself. A wooden box a foot and a half square and ten or twelve inches deep, such as the grocer will give you or sell for a nickel, will do for the frame. Knock out the bottom and one side and substitute window-glass. Then place the converted frame with the glass top over the space where the melon seed are planted, with the glass side towards the south. It is better to arrange the overhead glass so it can be slipped back and forth a few inches to allow an opening for ventilation in the middle of the day. This contrivance will enable the amateur who uses it to get a start of three weeks or more on his neighbour's mel-

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ons. It costs very little and the boxes may be used season after season and for many purposes other than that of giving early warmth to the melon patch.

If the seeds are planted in a cold-frame or elsewhere under glass except under the boxes in the garden where they are to remain permanently, they may be put in a month before the outdoor season begins. Before transplanting wet the soil well so it will cling to the roots and then dig up each plant with as much soil as possible and transfer quickly to the prepared hill.

Sandy soil, with an abundance of humus in it, is best for the cantaloupe. But if Everyman's Garden is not blessed with that variety of earth he need not forego the satisfaction of having a melon patch. The plant will grow in any soil with proper care. But the heavier and more clayey it is the greater the necessity of breaking and lightening it up by ploughing under old leaves or manure.

Melons may be planted in hills or drills. The hill is the older and more popular device. Planting in rows or drills with plants a foot apart is the modern plan of many of the large commercial growers. Hills should be four feet apart if three or more plants are

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allowed to remain in each. Plant at the outset six or seven seeds to make sure of having three or four to select from after they show above ground. Of course, the smaller the number left to grow and develop to the fruiting stage the better in flavour and larger in size the melons will be. If you have plenty of room, or if you prefer quality to quantity, leave only two plants to a hill. If you wish to raise just a few melons of prize-taking qualities to talk about and serve at the table for some specially honoured guest try a few hills with only one plant each. It is worth while. For this special crop pinch off the vine three or four joints beyond the melon as soon as the fruit is set, so that all the strength and goodness will go into that one melon.

Preliminary tillage of the ground should be deep and thorough and a liberal supply of barnyard manure should enter into the fertilization. In addition to the manure that is broadcast over the whole patch be sure to put a forkful in the bottom of each hill. Cover that with a thin layer of earth, so the seed will not come in direct contact with it, and then put two inches of well-fined earth over the seed. This must be firmed down with the foot or hoe, as in

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any planting, and then for a finishing touch sprinkle over a very light cover of loose, dry soil to form a dust mulch to keep the moisture underground. This method of planting assures the seed of the best conditions under which to start, and the forkful of manure under the hill serves as a reserve supply of plant food for the roots to draw upon when they most need it to offset the tremendous drain of the vine and fruit development.

Weed and grass growth must be an unknown quantity in the melon patch, and to this end, as well as to conserve moisture, there must be very frequent cultivation from the time the plants first show, a week or so after the seed goes into the ground, until the end. To cultivate the entire ground, even after the vines have spread widely over the patch, it is well to use the small, short-handled weeding tools with which you can work under the stems and leaves. If necessary the vines may be moved about gently so that the gardener may get at every inch of the soil.

As a precaution against worms and rotting place each melon on a shingle rather than let it remain in contact with the earth.

Every lover of cantaloupe knows his own likes and

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dislikes best, but there are three well-known types of melon recognised by the Government Department of Agriculture and by the horticultural societies within which all the various shapes, sizes and colours of melons may be classified. These are the Rocky Ford and Jenny Lind, or small type; the Hackensack, or medium variety; and the large Montreal Market. If you succeed in raising a Rocky Ford or Jenny Lind about five inches through from the stem end, just a trifle less than that in the side-to-side diameter, with a small seed cavity from which the edible part extends all the way to the rind, shading gradually from light to deep green, and with the outer surface of the fruit evenly netted all over, you have got what the experts would call a perfect melon. If it is perfect in all those particulars the flavour and texture are very apt to be all that they should be.

Yet this may all be spoiled by picking at the wrong time. The melon is at its best only when allowed fully to ripen on the vine. The sure test of this fullness of development is the ease with which it may be plucked. If the slightest tug is required to remove the fruit from the vine it is not quite ripe. Leave it another day or until it comes off in the hand

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almost at a touch. There is one more danger of your being cheated of the full enjoyment of the perfect thing you have produced: Cool the melon but do not ice it, for that will impair the delicacy of the flavour you have worked all summer to get.

If your garden is far north, where the growing season is short, the natural process may be helped out to a considerable extent by raking into the soil of the melon patch an application of nitrate of soda. Two pounds for a patch twenty feet square will be sufficient. This will materially hasten the plant growth and put the vine in condition to bear its fruit earlier.

As a rule the saving of seed by the amateur for next year's planting is hardly worth while, because the professional seedsmen can do that work so much better and because their product is so cheap. But in melons Everyman may well make an exception, thereby adding something of the scientific pleasure of propagation improvement to the ordinary delights of gardening. But his determination to do this should be made at the outset of the growth of his vines. It will not do simply to save the seed of one or two melons that are particularly juicy or well flavoured.

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The gardener must be sure that those particular fruits came from vines that were particularly thrifty in their growth and free from all diseases.

Frequent sprayings with Bordeaux mixture afford the best remedy for the blight or mildew which often afflict melon vines. It is worth while to use this spray as a preventive even if the vines appear to be all right. Kerosene emulsion will free the leaves from the melon plant lice and thorough dusting with tobacco powder is a good thing to save the patch from the striped cucumber beetle.

CUCUMBERS AND PARSLEY.

The cucumber has an ancient and honourable lineage. It was a favourite food in India three thousand years ago. A thousand years later the Chinese adopted it and in the latter part of the sixteenth century it was introduced into England. Since then every generation of gardeners has done something to improve it.

Nearly everything that has just been said of the cultivation of the melon could be repeated for the cucumber so far as preparation of the soil and thorough cultivation after planting are concerned. Sandy

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soil will produce the earliest crop, but cucumbers planted in a clay loam will, other things being equal, be more prolific and the vines will produce later. For succession crops the seed may be planted all through May and June. Although it will not stand frost the cucumber is not so sensitive as the melon.

Pests and diseases which attack the two plants are practically the same and so is the treatment.

If planted in hills, the popular way with the amateur, the cucumbers should be at least three feet apart and not more than five vines left to a hill. The first appearance of the leaves should be a week after the planting and the first of the crop ought to be ready in nine or ten weeks.

Parsley makes a most attractive border for the garden, and when so used takes so little room that Everyman need not hesitate to try a little on the ground that it is not much of a food product. Its use as a garnish for the real dishes adds a little to the gardener's pride, which increases in proportion to the number of different things he can boast of as of his own raising. It is a slow-going plant at best, so it should be started by the middle of May; for the fall crop, seed can be sown through June. Sow

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thickly in very shallow drill along the edges where borders are wanted, and when the plants are up thin out to four-inch intervals. For good results the soil must be reasonably rich, and as nothing but leaf growth is wanted the fertility may be obtained by the use of nitrate of soda or pulverized old hen manure sprinkled beside the row an inch or two from the plants.

CHAPTER XVI



JUNE—THE FIRST HALF

A HEALTHY young plant shows its condition even to the novice just as a healthy baby does. If you find a tomato plant of the spindling sort help Nature out by burying two or three inches of the stem—that is, make a shallow trench from where the root is set in the ground, gradually sloping to the surface; bend the plant so that a part of the stem may rest in this trench and be covered with soil. Then bend the projecting part upright and support it with stake and string. From the buried part of the stem a new root system will start, giving enough underground works of the plant to support its growth and give it a fair chance to yield a crop. But that is a good deal of bother. It is better to get strong plants in the beginning.

The tomato is a plant with a history. It started in South America, probably in Peru, where it was

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used as a food, got across the Atlantic to Europe, where it was cultivated extensively in the Mediterranean countries, and finally crossed the Atlantic again, this time to the United States, where for years it was dreaded as a deadly poison. There is a case on record of an Italian trying to sell some in Salem the first of the last century. Salem felt as bad about it as they had about the witches a hundred or more years before that. But the South was less sceptical. People began to eat tomatoes in the Gulf of Mexico region and the habit gradually overspread the country.

Of this history the one fact that the amateur in his garden should remember is that the tomato had its origin in a hot country and has never been bred or developed out of its dependence upon heat to make a good showing. The daytime temperature at which it will do its best is 80 degrees, but it will grow well in climates with a much lower average temperature than that. It will do no good, however, to set the plants out in the open garden until the chill is entirely gone from the soil, and on cool nights, especially if a frost is threatened, the young plants should be covered with newspapers. Give them a

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southern slope, if you have one in the garden, to assure the maximum of heat and sunlight; also provide a windbreak to the north.

As for soil, sandy loam is the best but there is no soil that the tomato will not grow in and produce fruit if it has proper care and fertilization, always providing that the drainage is good enough to prevent the standing of water on the surface. Tomatoes have been grown on a clay heavy enough for the making of brick and, on the other hand, they have grown in soil so sandy that the only body to it was what was artificially provided by the working in of large quantities of manure. So no amateur gardener need forego the pleasure of raising tomatoes because of the character of his soil. But the best is always the best, so if there is a spot of sandy loam put the tomatoes there. They will not only yield larger crops, but the fruit will be of better flavour and more symmetrical in shape.

Shape and flavour suggest, naturally, the three methods of growth. Plants may be allowed to grow naturally and straggle over the ground. They may be left unpruned, but held off the ground by some four-sided, trellis-like contrivance, or they may be

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pruned to the single main stem and that tied to a stake.

Single-stem staking of plants sacrifices something in the number of fruits because so much of the bearing portion has to be cut off, but much is gained in the flavour, general quality, size and shapeliness of the tomatoes. It stands to reason that a single plant will do better by a few fruits than by many. Constant cultivation close to the plant is also possible by this method, and the numerical loss of fruits is offset in part by the possibility of setting the pruned plants closer together than those that are allowed to run where they will, so more can be placed within a given area. For staking use stout sticks long enough to go a foot into the ground, with four or five feet above the surface. They must be placed firmly enough to bear the constantly increasing weight of the plants and their crop, and to stand rigid in any wind; otherwise a storm may spoil the whole scheme.

Stakes should be set when the plants are put out — an inch or two away — so there will be no tearing of the roots by poking the sticks down after growth has begun. As the upright stem of the plant increases its height, it should be tied every foot or so

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to the stake, pinching off the side shoots as they appear and finally pinching off the upright growth of the main stem itself when it reaches the top of the stake. Careful observance of these very simple rules gives not only tomatoes that are perfect to the eye and to the taste, but a plant that is in itself an ornament to the garden.

Allowing the whole plant to grow, but inclosing it within the four supporting sides of a lattice-like enclosure has, in common with the stake system, the advantage of keeping the foliage and fruits off the ground and gives the gardener much clear space between plants in which he can do a lot of useful work with the hoe. Of course the trellises cost more to buy and are much more bother to make and the fruit is apt to lose something in quality because of its greater abundance.

The third method, that of letting the plant run all over the ground, with half of its fruit being spoiled or injured by coming in contact with the soil, may or may not be justified in a large commercial patch, but it is certainly not advisable in the small, well-kept inclosure of the amateur's garden.

The tomato is one of the few vegetables of which

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it is worth while for the amateur to save his own seed. For that purpose select the finest fruits from the thriftiest plants that have made the best showing from start to finish. The source of the commercial supply of seed is not always what it should be. Some of the big canneries have installed machinery by which the seeds are separated from the pulp and these are sold to the seedsman. Since good, bad and indifferent tomatoes go into the cans the seeds are of the same degrees of worth and worthlessness.

Barnyard manure is excellent for the tomato patch and should be worked into the ground if the soil is lacking in humus or decaying vegetable matter — that is, if it is too heavy with clay or too thin with nothing but sand. But if the texture of the soil is all right the manure may be left out and the fertilizing done more conveniently and cleanly with chemicals. There are commercially mixed fertilizers that serve the purpose, but you may make your own ideal chemical combination at trifling expense and with little effort.

For a patch twenty feet square — room for thirty-six staked plants, placed three feet apart each way — buy two pounds of nitrate of soda, five pounds of

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bonemeal and one pound of muriate of potash, a total of eight pounds. Mix these three essential plant foods thoroughly, scatter the mixture on the tomato patch and rake it well into the soil. If here and there you find a plant that does not seem to be up to the average of the patch in the making of stem or leaves its growth may be stimulated by giving it just an extra pinch of the nitrate of soda. Furthermore the tomato patch, as well as every other part of the garden, will show its gratitude for a thin sprinkling of wood ashes. These take the place of the muriate of potash.

There are many varieties of tomato plant to select from. Some are so big that they might almost be classed as vegetable freaks, but seldom do these varieties produce a large proportion of shapely, perfect fruits of good flavour. For your own garden there are no surer, more satisfactory standbys than Earliana for the early crop and the Stone tomato for the main crop. Out of every five plants set out four should be Stone.

Like the tomato, the eggplant is of tropical origin, and all suggestions concerning the former vegetable as to soil, temperature, protection, cultivation and

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selections of thrifty plants apply to it. The plants should be set from two and a half to three feet apart and the soil — sandy loam if you have it — must be kept friable by frequent cultivation. The chemical formula given for tomatoes may be modified to advantage for egg-plant fertilization by adding an extra pound of muriate of potash to the mixture.

Peppers, the third plant in this same group for setting out in June, will thrive best under exactly the same conditions of soil and culture that have been laid down for the eggplant.

In the early stages of their growth the eggplant, pepper and tomato plants may be nipped off close to the ground by cutworms. The drier the weather the greater the danger from this pest. Get rid of the worms by making a poisonous mash of wheat bran and Paris green and sprinkling the stuff on the ground near the plants. This is the easiest and at the same time the most effective way.

Then there is the green tomato worm as big round as your little finger and from two to three inches long, armed with a horn on its head. Other pests prey upon these worms themselves to such an extent that they seldom become numerous and do little dam-

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age to the plants by eating the leaves, their sole method of attack. They are so conspicuous that they may be got rid of simply by knocking them off and crushing them on the ground.

The next one of the enemies to be watched for is a smaller worm that bores into the fruit itself. It is the same animal that gets into an ear of corn and eats the kernels. Tomato patches remote from the corn are seldom seriously troubled by it. A Parisgreen spray will kill it and this poison may be used with absolute safety when the fruits are small and green.

Various small insects, including the flea beetle, may be kept off the plants by dipping them before planting in a solution of an ounce of arsenate of lead in three gallons of water.

Aside from the green worm with the horned head, eggplants and tomatoes have practically the same insect enemies and the treatment is the same for both plants. Except for the cutworm and a weevil that is confined to the Southern states the pepper is remarkably free from living pests.

Spraying all three — eggplant, peppers and tomatoes — with Bordeaux mixture will prevent or control the fungous diseases that sometimes afflict them.

CHAPTER XVII



JUNE—THE SECOND HALF

IF you are sticking by your own place for your summer vacation, having decided that you will not only save money that way but will get more real fun and relaxation in your garden than anywhere else, you can still enjoy holiday travel in your mind by trying to do in that garden as an extra diversion what some other amateur in another part of the country or of the world does in his garden as a matter of course. One chief purpose of going away is to see strange things. Raise strange things in your garden. No matter what part of the country you may be in, there are some flowers and vegetables unknown in your neighbourhood that will justify a little experimentation, providing you have a few square feet still unoccupied. Now, near the end of June, when the serious part of the garden work is all planned and well under way, is the time for a little frivolity with soil and seed.

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Try peanuts, for example, if you have a hundred days left before the average date of the killing frost of your region. You have that much time unless your garden happens to be in Northern New England or in the upper tier of the Western states.

Plant a few gourds for the oddity of the things. They grow very quickly and are to be cultivated in about the same way that melons are. You can probably grow your own calabash pipe and a dipper for the kitchen.

Having your pipe, or several of them to supply guests, you will naturally think of tobacco. Raise some of that too, not because the smoking of it will be very satisfactory, but for the fun of the thing. A plant or two are worth trying almost anywhere south of New York, and tobacco is raised successfully in the Connecticut River Valley way up into Massachusetts. When you have raised one or two tobacco plants — they grow to a height of four feet or more — hang them by the stems to the barn or attic rafters to cure. Open the windows on dry, bright days and close them in wet, foggy weather so the dampness will not cause mildew on the leaves. That is the way your white ancestors did in this

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country, having learned the trick from the Indians.

The women of the house can match the men's tobacco and calabash victory by pouring for their friends some tea grown in the home garden — if that garden is in any one of eight or ten of the Southern Atlantic or Gulf Coast states.

The sweet potato is another uncommon vegetable for the amateur's garden, but it is much more than a freak or a joke crop. It is grown in quantities in Southern New Jersey, and eighty miles farther north it has done well in small gardens for the home table.

Pumpkins and Hubbard squash, which belong naturally in the New England states, are worth trying in other parts of the country to get a home-grown supply of the things that make the best pies. If there is still room try a little garlic.

Now to be more specific about these uncommon things with which you may amuse and interest yourself. There are at least twelve kinds of gourds that will grow in almost any part of the country. They all make rapid and extended growth and can best be disposed of by trailing over a fence or trellis, where they will be out of the way and where their orna-

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mental foliage and curious fruits will make the best showing. Get the dipper and bottle varieties as well as the calabash, and try one Chinese Luffa, the inside of which can be used as a sponge. Gourds can be planted throughout June. Put the seed two inches deep in a sandy loam, and before planting work in a forkful of old manure.

The sweet potato has nothing in common with the ordinary tuber so far as cultural methods and requirements are concerned. Buy the plants and set them out in sandy soil in rows three feet apart, with foot intervals between the plants in the row. Keep an eye on the weather and try to do this work just before a shower.

Light soil is essential, and the more it is broken up by the forking in of manure to renew the humus supply the better for the crop. For fertilizing purposes chemicals are better than the barnyard manure used alone. So for a sweet-potato patch about twenty feet square supplement the previously worked-in manure with the following mixture: One pound of nitrate of soda, two pounds of bone black and a pound of sulphate of potash. Clean cultivation is essential throughout the period of growth. If frost

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should catch you before the potatoes are quite as large as they should be harvest them just the same. There will be no loss in flavour or quality.

Peanuts should be planted later than corn or lima beans, for they are even more sensitive to a lingering coolness in the soil. The earth must be of the right sort mechanically, for the peanut buries itself and it cannot do that if the ground is hard or stiff. Not only sandy soil is necessary, but it must be well tilled and loosened up to a depth of six or eight inches and kept in this condition until after the plant has performed its ostrich-like feat of burying its head in the sand.

The peanut is not a root, as most people suppose. Neither is it a nut. The plant blossoms above ground; then when the flower has shed everything but the ovary, which is provided with a sharp point for boring, the stem turns earthward and the ovary bores its way into the soil, where it develops into the pod. The root system is as entirely separate from the peanut as the root of the bean plant is from its pod. If possible get the seed from a dealer who sells peanuts for planting purposes and who can tell you what variety you are getting — whether the

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Spanish, the Virginia runner or the Virginia bunch — as knowing the variety will enable you to space your hills to the best advantage. But if that is not convenient just go to the fruit and nut store for your supply, making sure of course to get peanuts that have not been roasted. Virginia runner peanuts should be planted in rows a yard apart, with sixteen-inch intervals in the row. The bunch variety can be in rows only thirty inches apart, the plants only nine inches apart in the row. The same distances will do for the Spanish and Tennessee Reds.

Buy a quart of the best-looking peanuts you can find in the store, pick out those of the best shape and size and shell them. Plant three or four shelled nuts every sixteen inches to provide against failure to germinate, but after they have started pull out all but one plant from each group. Cover the seeds with an inch and a half of soil. Peanuts may be planted in the shell, but the germination is several days slower.

It is the Spanish peanut that is used for the making of peanut butter. Roast the nuts, before or after shelling, in a moderate oven, until they become crisp without any suggestion of burning. Stir them

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about frequently in the course of the roasting process so they will be done evenly. Then remove the red skins, split the nuts, knock off the seed germs between the halves, and put the separated nuts through the meat grinder. Grind them as fine and smooth as possible and put the "butter" away in sealed jars.

Making the butter, however, is getting ahead of the story. Let us finish raising the peanuts first. To do that successfully the soil must not only be in the right mechanical condition to let the stems get underground, but it must be amply supplied with lime and well fertilized.

For a patch of ground twenty feet square put on ten pounds of agricultural lime and work it in when the preliminary spading or plowing for the peanut crop is being done. Apply the fertilizer later, half at the time of planting and half after the plants show above ground. This fertilizer should not be barnyard manure unless you apply it a year in advance. There is a double danger in using the manure at the time of planting. It contains too many weed seeds and it is apt to cause an abnormal growth of leaf and stem of the peanut plant and small and only partly filled pods.

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Here is a good chemical mixture for potatoes which makes an ideal fertilizer for peanuts, reduced to proportions for the twenty-foot-square patch: Two pounds and a half of nitrate of soda, six pounds of bonemeal and two pounds of muriate of potash. This must be thoroughly mixed into the soil with a rake. If you have any wood ashes they will serve well on the peanut ground as a substitute for the muriate of potash.

Cultivation must begin immediately after planting and should be kept up faithfully until the plants are well developed and begin to form the pods. With each cultivation work a new supply of loose soil toward the plants from both sides, so that the stems will be assured of a soft bed of earth in which to bury the ends. It is not necessary to bury these ends yourself. Nature will look after that if she has half a chance.

Harvest the peanut crop when the vines begin to turn yellow in the fall. Careful digging with a potato fork is the best way. Peanut plants are remarkably free from insect pests and disease, but do not tempt fate by planting them on the same ground next year, no matter how good a crop you may get

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this season. They require rotation, so if the peanut experiment is to be repeated another season plant them where the corn is now. Crop or no crop, remember this — the mere growing of the peanut vines in your garden will greatly improve the soil, for they are great gatherers of nitrogen.

Both pumpkins and the winter or Hubbard squash may be planted in June. You need only a few, so the hills should be eight feet apart, with three plants growing from each hill. Sandy soil is best. Cover the seed with an inch and a half of soil and have in the bottom of each hill a forkful of old manure. Then cultivate well and watch them grow.

CHAPTER XVIII



JULY—THE FIRST WEEK

ALL the arguments for having home-grown fresh fruits and vegetables in the season of their harvest may be advanced with even greater force and reason in favour of carrying the supply right on through the winter and until it is time for you to start your garden for another year. Great as the difference may be between a mess of green peas picked from the vines back of the house shortly before dinner and a mess from the grocery store, there is a still greater difference between the quality of the home-grown and home-canned peas and the can that is bought. This difference is not only in flavour and tenderness, but in the comfortable assurance of cleanliness and perhaps safety from disease and poison.

Of course pure-food laws have done much good and there are many big commercial concerns putting up the best fruits and vegetables in the best way

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they know. But they don't grow the stuff in the first place, and they cannot control the time of its picking and the time that must elapse between picking and canning — two factors that are very essential in the matter of having vegetables in winter that can compare in colour, taste and tenderness with the summer supply.

Furthermore, nothing is so conducive to your sense of independence as to furnish a material part of your own food supply, not merely for a few months, but for the complete round of the calendar. It may mark your transition from the salaried man who works in one place and lives in another to the happy state of the prosperous farmer who gets all his living from his own land. Scores of modern, scientific farmers of to-day were born in cities, moved to the suburbs as their first experiment, and got their first dream of owning acres from the fun of having a two-by-four-foot radish bed. But back to the canning.

The winter's supply should be provided for in the original laying out of the garden and in the scheme for succession planting and companion cropping. If you neglected that important matter at the be-

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ginning of the season it is not too late to offset the blunder now by making allowance in the mid-season planting for later crops.

Try to arrange the harvest times of the fruits and vegetables that are to be kept for winter so they will come as close together as possible. This will mean the bunching of the business and save much hard work in a hot kitchen. It is as difficult to put up one can as a dozen, so there is no point in spreading the process out over the summer.

If the gardener arranges his end of the business skillfully his wife ought to be able to put up food enough for all winter in several canning periods of not more than three days each. One row of beans, for example, may be all he will want to come into bearing at one time to furnish a supply to be eaten as it is picked. But if there is room it is better to have all the bean supply to be canned come from one planting of as many rows as are required.

Cultivation and ample fertilization have direct bearing on the winter supply as well as on the day-to-day output of the garden, because only the best should be put in cans; and vegetables that are grown quickly, even forced a little by plenty of plant food,

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make the best showing when put up. They should be picked at the proper time to retain their tenderness and colour — a day or two earlier than would be necessary if they were to be eaten fresh from the vines. That is the secret of successful canning. Anything that is left on the vines a day or an hour too long, until the hardening and yellowing process sets in, is going to be tough, lacking in flavour and in that delightful natural-green colour that ought to distinguish all home-canned garden products from the commercial varieties.

There are two more points to look after closely: Pick in the morning when the dew is on the plants, before there is any suggestion of wilting; have the jars and the various cooking utensils in readiness, the fire going well and the water boiling. Then do the necessary shelling, stringing, cutting up and other preparatory work in a cool place and rush the fruits or vegetables to the sterilizing jars. If careful work is done in the sterilizing, cooking and sealing the vegetables will keep for months in very much the same condition as at the start, so the taking of pains in the preliminaries is well worth while.

The old notion was that excluding the air was what

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kept things from spoiling. This was based on the wrong theory that oxygen caused the decay of vegetable matter. It is still necessary to keep the air out, not because it in itself or the oxygen makes trouble, but because it is filled with germs, and the old way of sealing the jars with metal or glass tops is still the most convenient thing to do.

The canning possibilities begin with rhubarb in spring and do not end until Thanksgiving, when pumpkin and mincemeat bring them to a fitting close.

Contemporaneous with the rhubarb is asparagus. The home canner may cut the asparagus into the long portions usually served and pack them carefully, tips upward, in wide-mouthed jars. But the simpler way is to cut the tender tips into pieces an inch and a half long and pack the jars as full as possible. Then fill the jars with cold water, adjust the covers loosely and place the whole in the steamer to be boiled for an hour, with the steam escaping. Then clamp on the covers tight and allow the jars to cool until next day. On the second day, with the covers loosened again, put the jars in the steamer and allow them to remain there for an hour after the

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water comes to a boil. Clamp and cool till the third day, when, after the third boiling, the jars are sealed permanently.

The reason for these repeated boilings is that while the parent bacteria succumb to the first high temperature, their spores are more tenacious of life and begin to germinate promptly as soon as the first cooling process is under way. The second boiling kills off this second batch of bacteria before they have developed new spores. The third boiling, while not absolutely necessary, makes assurance doubly sure and enables the housewife to seal her jars with the certainty that they will keep perfectly.

By the end of June the canning season proper is on, with the peas and the beans as the top-liners of the performance. The best peas for canning are the early varieties. The later ones cannot be relied upon to be tender and of the sweetness that has made this special delicacy famous. Peas should be gathered a day or two earlier than is usual for table use, picked while still cool and dewy, shelled by the collaboration of the household on a breezy porch, then packed in clean jars and cooked by steam according to the directions given for asparagus.

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For string beans the same rule applies. Be sure to gather the beans while they are a little smaller than one would want them for immediate consumption. This precaution is especially important in the case of peas and beans and makes all the difference in the world in the finished product. Both these vegetables lose considerable bulk in the cooking process. For this reason it is well to put one extra jar through the steaming operation and then use its contents for the filling of the others after their contents have shrunk at the end of the first day's boiling.

Corn is regarded by many as an unlucky vegetable for canning. But if picked while very tender, cut from the cob at once with a keen knife that leaves no ragged kernels, packed tightly into the jars, which are then filled with cold water, and cooked by steam as already described, there should be no difficulty. Another way is to take extra large jars, say of the four-quart size, and can the corn on the cob.

To do this it is necessary to select very tender ears of a small-cob variety. They should be subjected to the boiling process for an hour and a half instead of an hour on each of the three days. The result will be a platter of corn on the cob on your

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table in midwinter, equal in appearance and flavour to that of summer.

Tomatoes deserve an epic all their own. Their peculiar and delicious acid is most desirable as an offset to the heavy winter menus. They are the simplest of all vegetables to can and to keep and offer a variety of uses such as nothing else in the garden can. First choose your tomato — a dependable, solid variety, such as the Stone.

Gather the fruit while it is in its prime, not in the least overripe or watery. Scald the tomatoes, thereby making the removal of the skins a very easy matter, and cut the pulp into quarters, merely to hasten the cooking. Then fill a graniteware or porcelain-lined kettle — never an iron one. Tomatoes cook down very materially, so one can keep adding fresh-cut fruits to this first batch until the simmering mass is all the kettle can hold.

When the whole kettleful is boiling well the tomato juice will be found at the top, the heavy mass of pulp sinking lower down. Take advantage of this little fact of physics by dipping off this boiling juice separately into a hot sterilized jar and sealing it at once for future tomato soups.

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One who enjoys foreign cooking will not fail to prepare a generous supply of the *salza*—sauce—that enters so largely into the meat and vegetable dishes of French and Italian households. This is simply tomato cooked with celery and onion enough to flavour it well, then put through a very coarse strainer, giving a delicious, thick, pulpy sauce. It will transform a plain omelette into a feast.

Summer squash may be prepared and cooked as for the table, the excess water drained off, and the pulp packed solidly in jars and steamed for an hour and a half a day for three consecutive days before sealing.

Beets should be young and very tender. Prepare as for the table, slice thin, cover with water, and steam only an hour on each of the three days.

Canned eggplant is a great acquisition to the home bill of fare. Pare and cut into thin slices and leave them in boiling water half an hour. Then drain, pack into jars and steam as you did the squash. The half-hour cooking of the eggplant before canning makes the slices pliable, so they can be easily packed into the jars. When opened for use drain and cook like fresh eggplant.

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If the cauliflower crop shows signs of not keeping well the heads may be prepared as for the table, packed into jars and sterilized, ready to be reheated and the desired sauce or seasoning added.

Many persons can even carrots and parsnips, claiming that these vegetables when small are free from the strong flavours they develop if allowed to come to maturity, and so are really more palatable than if stored in the cellar.

Lima beans are canned in the same manner as corn or peas. Canning the pumpkin or winter squash is the only sure way of keeping these vegetables beyond December or January. It is done just as in the case of the summer squash.

CHAPTER XIX



JULY—THE SECOND WEEK

JULY is the month in which the gardener must co-operate with Nature in bringing to perfection what, between them, they have already started. It is the month for developing and putting on finishing touches in form and size and colour rather than a period of starting new things. This is particularly true in the flower garden and with the shrubs and hedges. Of course with vegetables it is always seed-time so long as there is a vacant space left and a sufficient number of days before frost for some quick-growing food supply to come to maturity.

In the flower garden the new beginnings are narrowed down to the filling in of empty spaces, where this or that plant has died, by the setting out of a late aster or a bit of flowering stock. The rule to fill in the gaps and offset the losses is always a good

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one to follow in a flower garden, not only for the sake of appearances but for the health of all the plants. The fault of the amateur gardener is not that he crowds too much into a given space, but that he leaves too much bare ground in his flower beds, or waste space for weeds to occupy. Nature covers every square inch.

The amateur's error is due to his good intention to have what is mistaken for an appearance of neatness in too wide patches of cleanly cultivated earth. A flowering shrub or plant is more attractive than a spot of bare soil, no matter how clean it is. And enough plant food can be supplied to nourish every leaf and blossom there is room for.

This brings us to consideration of the prime job of July in the flower garden — summer fertilization to add to the richness of the flower colours and to deepen the green of the foliage.

It is assumed that you were liberal with manure at the outset of the season, when you planted your seed and set out young plants. But there has been a drain on that original supply of plant food during the past two months to make the body of the plants and the early blossoms. More plant food now, sup-

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plemented by judicious cutting back and pruning, will prolong the flowering season of some of the roses and other plants that are supposed to end early in June. It will increase many times the vigour of the plants that blossom all summer, and it is particularly valuable for the things that are just now coming into flower, such as the Japanese iris and the many fine varieties of phlox.

The ideal plant food for all flowers through the summer is liquid manure. This is best made from cow manure if you can possibly obtain it. Be wary about the use of horse manure unless you are very sure it is old and thoroughly rotted. Horse manure will do very well to dig in for the spring fertilization, when the ground is being prepared. It is a risky thing now, as are chemicals. So try to find a man with a cow and get a wheelbarrow load from his dung-hill.

Put a bushel of the cow manure into an old grain sack and suspend it in a barrel of water. A fifty-gallon kerosene barrel or an old liquor cask of the same capacity can be obtained for little money at a store and will serve this useful purpose for many seasons. Hang the bag of manure in the water so it

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swings clear of the bottom of the barrel and leave it three days.

A gallon of the mixture is not too much for one full-grown rose plant. Before applying it scrape the earth out for a foot or more all round the plant, just deep enough to make a shallow basin. Then pour in the gallon of liquid manure and as soon as it has soaked into the soil cover the moistened circle with earth to prevent evaporation. That particular rose plant will fairly revel in the richness of its nourishment. Repeat this application two weeks later.

For the phlox and iris and all the rest apply the same kind of fertilizer, but in smaller quantities.

If you cannot secure cow manure, sheep manure, pulverized and bagged, is a handy and efficient substitute. It is a more highly concentrated fertilizer than cow manure and should therefore be used more sparingly. A small quantity mixed with the soil about the rose plants will give almost as good results as those attained from a liquid application.

To get the continued rose supply from this enrichment you must cut back the flower-producing portions to about two eyes, the nearer to old wood the better. If you are fortunate enough to have a

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Mrs. John Lang rose — the very best there is for the amateur's garden — it will bloom all season, anyway, but with added enrichment of this sort it will be the delight of the neighbourhood.

This matter of cutting back is worth a digression. Many things benefit by it. Golden glow, for instance, if cut down to within six inches of the ground when the first flowers begin to go by, will send out short side stems bearing a second growth of blossoms to follow the August glow. The same with phlox. Cut off the July flower heads before the seeds form and there will be a prolonged season of phlox blossoms. This digression might be lengthened to cover many other plants, but you should discover some of these things for yourself by experimenting. Bonemeal is another safe and effective fertilizer for July use. A pound of it is not too much for a single rose plant of good size, while a handful will do for small bushes and for flowers of other varieties. Always remember that the rose is a heavy feeder and if it goes hungry it will not produce the colour or the fragrance that your garden plan calls for.

Cultivate all summer, incidentally, to keep the

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weeds out of the flower garden, principally, to maintain a mulch of loose surface soil which will hold the moisture underground where the roots can get the benefit of it. A well-cultivated garden will do much better throughout an entire season marked by drought than a neglected garden will do in a summer of ample rainfall. That is not merely a theory of soil chemists; it is a hard fact that applies to every patch of ground that man ever tried to turn to his own account.

To save time and wear on the back do the cultivating with the push hoe or English scuffle hoe, rather than with the chop hoe. With the scuffle the cultivation is more shallow, but it is more thorough in breaking the capillarity of the soil—that is, the small tubes that form themselves into outlets for the moisture to the surface if they are not broken. Use the hoe after each shower, thus saving for future use of the plants all the moisture that Nature has bestowed.

There is one alternative to frequent cultivation—that is in having a permanent mulch of something other than the broken surface of the soil. In England, where they have the best gardens in the world,

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especially of roses, it is customary to keep a mulch of cow manure two or three inches deep spread over the bed throughout the growing season. This keeps the weeds down and the moisture in and with every shower the water, percolating through the mulch, carries with it to the roots of the plants the richness of liquid manure. But the average gardener in America would object to that method on the ground that it would be unsightly. But the fact remains that the English raise the finest roses. It is partly due to their cow-manure mulch method and partly to the fact that they are not afraid to prepare a rose bed four or five feet deep in clay soil. But that is another story.

If a shower falls on your garden in the middle of a summer day and is followed by sunshine there is no doubt that it is beneficial. Nevertheless stick to the rule that for artificial watering it is better to use the hose or sprinkling pot at sunset than at midday. And when you do water at night do it thoroughly — as thoroughly as possible without causing the soil to wash. Ten gallons put on at one time will do more good than twenty gallons doled out niggardly over a period of several days. A good watering once

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a week in dry times, supplemented by cultivation, is about right for the flower garden.

Don't forget that the pests are with you all summer in one form or another. Just about now you are at the height of the rose-bug season. That nuisance generally begins his feasting on the peonies and then shifts to the roses for his second course. He is also very fond of the coreopsis. Daily inspection of the plants and picking the bugs off by hand is the only insurance against the destruction of everything and anything they attack. There is no spray that will fit their case.

Hand picking is also the only sure method of protection against the aster beetle. Another helpful thing to do is to get rid of all goldenrod that grows anywhere near your aster bed. Wherever the goldenrod grows you will find the black beetle, that is death to asters. Hand picking for this insect should be a task for every morning. Then there are the leaf borer, the thrips and the green fly. Tobacco spray, either dust or liquid, will rid plants of the fly.

Hollyhocks all through the country have of recent years become a prey to the red spider, which attacks the under surface of the leaves, especially when the

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plants, for any reason, are not in thrifty condition. The spider sucks out the juices of the leaf. So the hollyhocks must be well nourished with plenty of plant food — bonemeal, cow or sheep manure — and have good cultivation. The hollyhock also offers an exception to the general rule against thinning. If the stalks begin to crowd, thin them out at the surface of the ground. As an added precaution against the red spider, spray with tobacco or weak kerosene emulsion.

There is a general rule to be applied to the pruning of all flowering shrubs — that is, do it as soon as the flowering is over and at no other time. That means a job for July, which is a flowerless month so far as the majority of the shrubs are concerned, their chief glory coming in April, May and June. The reason for the rule is this — the flowers of the year to come will grow on the wood that is formed between the blooming seasons. Nature requires a full year to bring that wood to bearing, so if it is cut off in the fall or winter or spring there will be no flowering.

Do not prune the Japanese barberry much at any time if you want it to be a winter ornament, filled

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with red berries, when outdoor colour is hard to find.

Pruning of hedges is another matter. They are primarily for boundaries, not for colour. Pruning should be done when form and shapeliness demand it. A California privet hedge grows about as rapidly and as irregularly as the hair on the head of a small boy with a cowlick and a double crown. It should be trimmed about as frequently too. The box hedge, if neglected, not only loses its shape but also its dense habit of growth, which is its chief merit.

Here is a suggestion for a plant in your flower garden that should be popular in this country, but is not. It is the *Viola cornuta*, or tufted pansy. If you can get it established in your garden — not a difficult matter — you are reasonably sure of having its flowers in the open from May until snow falls, with as wide a range of colour as that offered by the ordinary pansies. In England, where the plant is common, there are no less than sixty varieties.

The plants can be bought in this country from many of the seedsmen in the big towns. They are fine for borders, and if you are ambitious enough to have a bit of rock work in your garden the tufted pansy is the thing to give it colour. It is rather

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late, but try a few plants this year for an experiment, being sure, of course, to give them the benefit of a muslin screen protection against the hot sun until they get rooted. They require reasonably rich ground.

CHAPTER XX



JULY—THE THIRD WEEK

JULY planning and consideration of root crops, with reference to a supply of home-grown vegetables for the table next winter, naturally falls under two heads: What more can you plant at this period of the summer? And what is the best treatment for the roots already under cultivation to bring them to the highest state of perfection for keeping?

Throughout the middle of the country there is ample time for the planting of beets, carrots, rutabaga and the ordinary turnip. The last two vegetables are possible throughout the month, even in New England. If your garden happens to be south of a line drawn roughly across country touching the northern edges of Kentucky and Maryland you may make a planting of potatoes as late as the first of August. The custom is to use seed saved from last year, in many cases from the second crop. Seed

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potatoes need a rest varying from a few weeks to a few months, depending upon the variety.

It is not customary to plant parsnips — a root that should be much more popular than it is — later than April. That is the parsnip-planting time prescribed by usage and all the garden authorities. But it is always interesting and never harmful to deviate a little from authority in the garden and try an experiment on your own hook. The methods of cultivating the parsnip are exactly the same as those laid down for the carrot.

It is true that it is a very slow-growing vegetable, requiring about 125 days to come to maturity, but that is largely offset by the fact that frost never hurts the parsnip. As a matter of fact many gardeners leave the parsnips undug until after the ground has frozen, in the belief that they thus acquire more sweetness and better flavour.

The potato, of course, is the chief staple food you can raise. Your early crop, directions for which were given in chapter two, is about ready to dig — in many parts of the country it has already been dug and has added its very material contribution to the delights of a summer garden. But the main crop

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— the potatoes you hope to eat next winter — is just getting where it needs careful attention to make it worth digging at all.

The potato bug is something that the greenest novice in the garden can get rid of if he is willing to work a little, either by hand picking or with his spray. But the late blight of vines and the rot of the potatoes themselves which is sure to follow that blight are more difficult to understand and to control. It can be done by that same novice and his crop will pay him for the trouble.

In taking care of the blight you kill two birds with one stone, for the treatment not only saves the vines, but makes the crop larger in size and numbers and better in quality. Vine blight comes from the seed in which fungus trouble has developed through the winter. Affected potatoes sometimes show a pinkish tinge and dry rot, but it is not always possible to detect this at planting time, so you may put in affected seed potatoes without realizing it. The germs spread to the sprouts as soon as there is any considerable amount of moisture to give them a start, and soon spread over the growing vines, blighting the foliage and checking the growth of the tubers them-

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selves. But that is only part of the process. allowed to take its course the blight produces spores that fall back to the surface and make their way underground to attack the new potatoes.

To save the potatoes you must begin by saving the vines. That is best done by spraying with Bordeaux mixture at least once a fortnight, and oftener in very wet weather, until the plant stops growth and the normal wilt begins. The spraying should begin of course as soon as the leaves show the slightest symptoms of being unhealthy. But you will make no mistake if you adopt the Bordeaux treatment when your plants are about four inches high, even if they do not appear to be affected.

Spraying before a shower is always advisable, because it kills the germs that are sure to spread as soon as the plants become wet. If an ounce of Paris green is thoroughly stirred into ten gallons of the Bordeaux the spray will not only take care of the blight, but of the potato bugs too with one operation.

The sure sign of blight or rot is when the leaves begin to show dark spots, which soon turn soft and give off a very disagreeable odor.

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Cultivate the potato patch with the hoe throughout the growing season, and when the vines begin to overspread the bare ground between the rows it will not hurt a bit to do a little hand work to get out the weeds that will grow close to the vines and rob the soil of just so much plant food that should go into the making of the crop. This hand work will also maintain your earth mulch right up to the stems of the plants and thus save the moisture for the roots.

Fertilizing for the potato should be done before planting. As a matter of fact it is best done the year before planting, when a grass field that is to become a potato patch the following season should be heavily enough manured for two years. In this way you get the required richness in the ground without the danger of fungus diseases of the potato that lurk in barnyard manure when it is first spread, or the risk of burning by the use of chemicals.

Nevertheless a little judicious fertilizing after the growth of the plants begins is sometimes necessary to get a good crop. So if the plants seem hungry and lack thrift, when there is no disease to account for the difficulty, apply some of the special potato

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fertilizers that the seedsman sells and rake it in between the rows. Remember that this special potato food should be richer in potash than in either of the other two main fertilizing ingredients. Wood ashes, which contain eight or nine per cent of potash, would be useful were it not for the large content of lime which favours the growth of scab.

The rutabaga is a Russian or Swedish turnip; some professional gardeners call them "Swedes" for short. They are less watery than the ordinary turnip, have a richer flavour, and keep better through the winter. They also require a little more time to mature, but there is time enough this year to raise rutabaga and other turnips for next winter.

To save trouble the seed may be sown broadcast over the piece of the garden that is available for this vegetable. The plants will come up within a week and very thickly. Thin out so that each root left will have enough ground room in which to make its size, and there will at the same time be turnip plants enough left on the patch to keep the weeds out and eliminate, in part, the necessity of cultivating. A better way is to plant them in rows a foot or foot

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and a half apart, with six-inch intervals between the plants, and cultivate as you would any other row crop.

The best fertilizer for turnips, rutabagas and beets is a mixture in the following proportions for a patch of about twenty by forty feet: Pound and a half of nitrate of soda, four pounds of bonemeal and two pounds of muriate of potash. Buy your own chemicals in quantities to suit the size of your garden and mix them thoroughly yourself before raking into the soil. The cost is very slight.

The ideal soil is sandy loam, and the finer it is kept the better. The turnip will not thrive in a drought, no matter how rich the soil is, unless the moisture is kept in the ground by frequent breaking up of the surface. In a very dry time the turnip will benefit greatly from liberal watering with the hose after the heat of the day is over.

Club root, the same disease that afflicts cabbage, often attacks turnips and rutabagas. It is not a complaint that can be cured by spraying, so the only thing to do is to prevent it. Don't put the turnips where there was a root crop of any sort last year; take every precaution possible to get good seed;

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and as soon as a young plant shows signs of being abnormal pull it out and burn it.

Maggots working underground sometimes bore into the turnips themselves. Water the ground with strong suds made from carbolic soap. Slight freezing will not hurt the turnips, so the harvesting of this crop may be left till about the last thing in the fall work.

For carrots the best fertilizing formula differs somewhat from that just given for the beets and turnips, being stronger in the bonemeal, which supplies the phosphoric acid, and containing less of the nitrate and potash. The mixture for the carrots on the twenty-by-forty-foot basis should be one pound of nitrate of soda, six pounds of bonemeal and one pound of muriate of potash.

For anybody who has noted the fine, lacelike character of the carrot leaf the hint that there should be no coarse weeds near it is probably unnecessary. Neglect of weeding in the carrot bed from the very outset means the demoralization of the crop.

Sandy soil is best, and the more deeply it is cultivated the more shapely and the smoother the carrot roots will be. The rows should be a foot apart and

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four-inch intervals between plants is sufficient for the smaller varieties, which are the better ones for the home garden. They will keep better if pulled before maturity.

A beetle sometimes causes trouble by eating young carrot plants. It is a difficult thing to get rid of if it comes, and about the only thing worth trying is a spray of a very light solution of arsenate of lead. An ounce of the poison in about three gallons of water will do.

There are companion vegetables for nearly all the root crops — that is, quick-growing things that may be planted at the same time and which will be out of the way before the principal vegetables in the companion-cropping combination need all the ground. For example, put the root rows a little farther apart than you would ordinarily to have room for cultivation, and put radishes between them.

CHAPTER XXI



JULY—THE FOURTH WEEK

DON'T let yourself deteriorate from a garden enthusiast to a garden quitter just because the middle of July is past. It is only the shank of the season on the soil. There is much to be done, not only to bring the things already under way to perfect development, but to begin from the beginning with entirely new crops for the late fall harvest. Not even the annual going away from home for the vacation of a week, a fortnight or a month about this time of the summer is sufficient justification for letting a good garden go to the dogs ten weeks before its time. Get the new crops started anyway, and hire a neighbour or a neighbour's boy to look after things at least once a week while you are away, so that you will have a little more than a fighting chance against the weeds when you return and the fall supply of fresh vegetables for the table will make the trivial expense

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of the emergency caretaking seem as nothing at all.

The list of things that may be planted now is almost as long and enticing as that of May or June. Several of the vegetables which were started at the outset and have been eaten before this are to be repeated by at least one more successional planting. Others, untried so far this year, are going to furnish not only food, but the renewed zest in the garden which comes from each new enterprise.

Don't hold it against yourself if you feel a trifle blasé by the middle of July so far as another planting of radishes or even peas or six-week beans is concerned. Put them in again as a matter of course, as a matter of household economy, and then turn your attention to endive or spinach, for example, for the real interest in the second half of the gardening season.

Before specializing for the week let us enumerate the things on the general list that are still suitable for planting: Early varieties of peas may go in for the last planting any time within the next fortnight, except in the extreme northern parts of the United States. There are three weeks safely left for bush beans, also for lettuce. Early varieties of beets and

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carrots will be on the planting list until the middle of next month. Spinach, radishes and early turnips may be planted as late as the last of August.

If the family has an appetite for sweet corn on the cob that is not satisfied by the usual midsummer and late summer crops try another row now of some very early variety. If you have space it is well worth taking the chance of bringing it through to maturity. But on that particular vegetable there is no time to lose. Take all the gardening rules you can find, and for an average they will give you about the middle of July as the latest date on which you can plant corn. Deviation from rules by a week may be commendable independence and garden courage; by much more than that is plain foolishness.

Kohl-rabi can be started now with fair show of success, also another batch of small cucumbers for pickling purposes. But the time limit on them is the same as that for sweet corn. One year the writer planted an extra-early variety of corn the middle of July to see what would happen. It all came through in good shape, with all the ears well developed, and the first of it was eaten on the nineteenth of September. A guest that day was a neigh-

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bour who had ridiculed corn planting in the middle of July.

For the amateur who has not yet got the meaning of all the terms of the garden and the seed store clear in his head it may be helpful to explain that the terms "early" and "late," as applied to different varieties of various vegetables, do not mean that one is for planting early in the season and the other late. The words simply indicate roughly the length of time that a certain variety takes to come to maturity after planting. "Early" means a shorter and "late" a longer period of development. So for late planting always select "early" varieties of beets, carrots, corn or whatever else you are about to put in the ground.

For the familiar vegetables of the early summer planting, such as peas and beans, corn, lettuce and the rest, apply the same methods of fertilization and clean cultivation and earth mulching that served in April and May and June. In some cases, particularly with the new plants of lettuce and peas, extra precautions are needed in July and August to protect the growth from excessive heat. This is afforded by placing muslin screens over the plants for several

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hours during the extreme heat of the day. Of course the required moisture must be provided, either through the conservation process of frequent raking of the surface or by judicious watering. Also remember that hot weather is always corn weather.

Now for some of the things not ordinarily tried in the amateur garden, but which you should become interested in and plant now. Endive is surely one of them. If, as in the case of any other man, the way to the gardener's heart is through his stomach, let the promise of a wonderful salad be made now. It consists of lettuce and endive, with Roquefort cheese dressing. Just one portion of that with your own endive on your own table fifty or sixty days hence will pay for all the trouble you may take in the meantime to produce the vegetable. It is, in flavour and crispness, one of the most distinctive things that grow. It is a native of East India, but curiously enough very hardy as to frost and easy to raise in this country way into late fall. As a matter of fact it makes its best growth in the cool weather at the tail end of the season, just as peas thrive better in April and May than in July and August.

Get the seed of the curled or fringed leaf rather

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than the broad-leaved variety of endive, for it is much better for blanching and keeping for winter salads. Broad-leaved endive is better for greens and soup flavourings, using the leaves themselves rather than the stalks.

The best soil is a sandy loam. The planting may be on the spot where the vegetable is to have all its growth, or it may be planted in a seedbed and then transferred to the permanent place. One way is about as good as another. The slight advantage of transplanting hardly pays for the trouble. By following the simpler method you have only to thin out the plants to six-inch intervals. If they are transferred from a preliminary seedbed give them the same six-inch spacing in transplanting. Seed should be covered very thinly with earth, but placed close in the drill to assure an ample supply of healthy plants after thinning.

Thorough preparation of the soil before planting is of great importance. Dig well to the depth of the spade, clean off all the weeds and rubbish and then make the surface as fine as possible by pulverizing with hoe and rake. If the soil is at all thin—that is, lacking in humus or decayed vegetable matter—

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use barnyard manure for fertilizer. If the mechanical condition of the soil is good a chemical fertilizer will serve the purpose better than the manure, for the plant food contained in it is released more quickly. Quick growth for endive, as for lettuce, is essential if it is to be at its best so far as crispness is concerned. For that reason a supplementary fertilizing with nitrate of soda, raked in between the rows after growth begins, is urgently recommended, no matter what material has been used for the preliminary enrichment of the soil.

For that preliminary fertilizing here is an excellent formula for chemicals for a patch containing about four hundred square feet: Three pounds of nitrate of soda, eight pounds of bonemeal and two pounds of muriate of potash. These quantities cost very little. Buy them separately so to be sure of what you are getting; mix them thoroughly with the spade, and then work the mixture into the ground. For the later fertilizing to produce quick growth of leaf and stalk take three pounds more of the nitrate of soda, by itself, and use it between the rows.

If barnyard manure is used for the same area of

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four hundred square feet instead of the chemical formula two hundred pounds will be about right.

Blanching is as essential in the raising of endive as with celery, otherwise the stalks are too bitter to be palatable. The process, a very simple one, should begin when the plants are about six inches high. Exclusion of the light is the thing to be attained, and the manner of doing it is of secondary importance. The simplest method is to tie the tops of the leaves together with yarn or raffia so that the outside leaves form a tight case about the heart of the plant through which the light does not penetrate. Banking with earth, as in celery blanching, or covering with leaves or straw, or shielding from the light by a tent-shaped contrivance of boards, will also do the work. Whatever the method adopted, extreme care should be taken not to tie up or cover when there is any water or dew on the inside leaves and stalks. If there is, the blanching process simply becomes a rotting performance.

When real cold weather sets in remove the plants from the garden, with some soil clinging to the roots of each one, and place them close together in a cool cellar or in a protected outdoor trench, well covered.

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In this way the supply of endive for salad may be carried into the winter.

Spinach is another plant that originated in the hot part of Asia but will grow here the year round without winter-killing. It may be sowed in the United States as late as the middle of September, will get a start before freezing, live in the open ground all winter if covered with four or five inches of straw, and resume growth the first thing in spring, thus producing one of the earliest home-grown greens. But it may also be planted now, in the latter part of July, for use late in the fall, as it requires only about seventy days to come to maturity and the early frosts will not harm the developed plants.

Rich soil is required for a really satisfactory growth of the proper size and greenness. Anything that is spindling or that falls short of that very dark green is not worth raising. Moisture is another essential. Have the rows a foot and a half apart with six-inch spaces between plants. Keep out all weeds, and even after weed growth has stopped, if it ever does, cultivate by shallow hoeing or raking for the sake of keeping the moisture in the ground.

Everybody likes spinach, but many housewives

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hate to cook it because it has so much sand and grit in it that it is a difficult thing to prepare. If your wife happens to be one of those who have declared they will not fuss with it any more ask her to give you just one more chance. Then, if she relents, try the Norfolk or Bloomsdale varieties, which grow in vase form, with broad, thick leaves that are supported on stout stalks and do not rest on the ground. That is the point: they do not get full of sand.

The best chemical formula for spinach for four hundred square feet is: Three pounds of nitrate of soda, ten pounds of bonemeal and two pounds of muriate of potash.

Salsify, or oyster plant, to be used in the same season, must be planted not later than the first of June, because it is of slow growth, sometimes requiring 160 days to come to maturity. But now is a good time to put in a little salsify for next spring. Like spinach, the salsify will get a good start in the fall and live in the ground through the winter.

CHAPTER XXII



AUGUST—THE FIRST WEEK

THE fruit and vegetable garden is one more item that may be added to the short but delightful list of the things of this world that improve with age. It may be made to class, on that score, with wine and good books, cathedrals and century-old lawns of England. It all depends on the gardener himself. And August is an excellent time to begin to assure better results for another year.

Get the idea of the garden as a continuous thing, not as a food-producing patch that begins in the spring and ends in the fall. With the adoption of the permanent notion you are on the right road to making your garden improve with age. You make lasting improvements in soil structure and establish a sinking fund in soil fertility to be of use in the seasons to come.

For this immediate season go on with the cultiva-

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tion and the weeding and add fertilizer where it is needed. But more care is required now of course in the application of manures — chemical or natural — than in the beginning, before planting. Otherwise something may get burned up by the very plant food that is given to enrich it. Liquid manure is the best possible thing to apply now.

Fertilize the asparagus bed now if you failed to do it at the proper time, immediately after the cutting season was over. Next spring's stalks of asparagus depend upon the food that the plants get before winter. Manure put on in the spring does little good to the crop of that same season. Spread a hundred pounds of well-rotted manure on every twenty-foot-square patch, or put the following mixture on the same area and rake it in between the rows: Two pounds of nitrate of soda, six pounds of bonemeal, and a pound and a half of muriate of potash.

As a beginning for the permanent renovation policy select the poorest part of the garden and determine to make it the best part before you are through with it. It can be done, perhaps, by dragging on a lot of new and better top soil, or by ploughing

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under large quantities of manure. But there is a surer way — one that is much more interesting and more permanent in its results. There will be no need of the new top soil, and the heavy manuring can be done later.

This method is to sow in August a cover crop of red clover, crimson clover or alfalfa. The three are named in the order of the ease with which they are raised. But the order of their benefit to the soil is the reverse. That is, the alfalfa will do much more good, if you can get it to grow, than the crimson clover, and this last is better than the ordinary red clover. They are all three clovers and, therefore, will all perform the very useful service of taking nitrogen from the air and storing it in the soil. But the alfalfa has a tremendous root system and, because of that, will add much more humus to the soil that is to be improved, and, which is of vast importance, these roots will break up and mellow the soil for a great depth.

Don't brush aside the idea of alfalfa as something that belongs only to large farming operations. Don't ignore it simply because so much has been said about the great difficulty of growing it except in

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certain favoured parts of the country. If you are not much north of the forty-first parallel of latitude it is worth while trying. Whether it fails or not in your particular garden, it is a most interesting experience and, in proportion, the soil benefits of a successful crop will be as great on a hundred square feet of garden soil as on a hundred acres of farm land.

Here is what the writer did with alfalfa in Middle Jersey, many hundreds of miles away from what used to be considered the necessary soil and climate conditions for this crop: His chief purpose was to renovate an old, run-out hay meadow and get the soil into better condition for a new peach orchard. There were a couple of quarts of seed left after the major operation was completed, so he put them on a piece of the garden, just for the fun of the thing, to see what would happen. The crop was a success, and a wonderfully improved section of that garden was what came of the experiment.

Preparation for the alfalfa on the hay meadow began in April with ploughing, very thorough harrowing and a planting to oats, which were cut late in July. In the little garden section the space on

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which the alfalfa experiment was tried had been planted to peas, six-week beans and lettuce through the early part of the season. The vines and other débris were all cleaned off and then the methods in the large field were all followed in miniature. August thirteenth the garden patch, about thirty by twenty-five feet, or 750 square feet, was ploughed; spading would do as well on a small piece. Then fifty pounds of lime was scattered evenly over the surface and harrowed in. A sack of soil, weighing about one hundred pounds, was scraped off the surface of a near-by farmer's field where there had been alfalfa and scattered over the garden patch for purposes of inoculation. This is not necessary if you inoculate the seed, which is a much easier matter. The writer did both in this particular case.

Then that land was raked over and harrowed and fined still further by hauling a drag of brush across it until it was absolutely pulverized and level, as fine a seedbed as could be made.

On August twentieth, just after sunset, the inoculated seed was sown, half of it by walking back and forth north and south to scatter it and the other half by walking east and west, to assure greater

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thoroughness and more evenness in covering the ground. Then the seed was barely covered by a very light raking. It is important to sow the seed just after sunset or before sunrise, because the strong light of the sun will destroy the efficacy of the inoculating bacteria if they are exposed to it.

This business of inoculating the seed is about as simple as boiling an egg. The United States furnishes the bacteria free of charge and tells you all about it. Write to the Department of Agriculture at Washington and tell them what you want to do. You will receive a small bottle of colourless liquid and two tablets. All you have to do is to sterilize a gallon of water by boiling it and put the bacteria in. Wet the seed with the mixture and sow.

Four days after the seed was planted in the garden and in the prospective peach orchard it was up and the ground well covered. The plant got an excellent start before freezing weather and came through the winter in good shape. Late in the fall it had been covered with a liberal coating of barnyard manure. In the spring it made a fine start, and if it had been ploughed under then its benefit to the land would have been worth while, but it was allowed

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to stand for two seasons in both the field and the garden to get a better root growth. The first year one crop was cut and the next year two, furnishing most excellent food for hens. Then it was ploughed under. The result is that the renovated part of the vegetable garden is now among the things that improve with age.

Try a small patch yourself this August. If the alfalfa experiment seems like too much of an undertaking sow a little crimson clover anyway, unless you are too far north. In that case make it red clover. Begin permanent garden improvement now and make it an annual plan.

CHAPTER XXIII



AUGUST—THE SECOND WEEK

As June and July were the ideal months for canning the surplus products of the garden, so are August and September the months for drying, pickling and preserving the surplus of middle and late summer.

If you have not got a surplus your garden has failed. Make a note of it as a guide for better planning next year. If you have only enough tomato vines to supply the daily craving of the household for the fresh fruits served as salad what are you going to do in the winter for chili sauce? Buy it, of course. Poor stuff at high prices. Next June you will know better and add a dozen or so plants to your tomato patch if you enter the blunder on the diary every gardener must keep.

The same with cucumbers needed for pickles, and all the other products of the garden which by one or more of the various conserving processes can be made

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to furnish a daily food supply for the family long after the garden is covered with snow. Plant for twelve months next time, and let the source of the winter supply be fully provided for on the garden map.

There are various reasons why we can early in the season and pickle later. The tomato will serve as an illustration. For canning purposes the big ripe tomatoes are used and the jars are filled from the surplus of the vines not demanded from meal to meal on the table. At that stage of the gardening season nobody likes to pick stuff green, and it is the green tomato that is used for pickling. Imperfect fruits will also serve the purpose, although the slice off the stem end should never be used. Making of chili sauce is also an end-of-the-season performance because the small fruits and the odds and ends of the late crop are as good for this as the perfect specimens.

Here is the recipe for chili sauce that has been used in the writer's family for three generations to season the baked beans of New England and the meats of the rest of the country:

Cook slowly, for an hour and a half, the follow-

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ing ingredients, stirring frequently to prevent burning: Eighteen ripe tomatoes, two green peppers, one onion, one tablespoonful each of salt, ground clove, ground cinnamon, ground allspice, one cupful of sugar, two cupfuls of vinegar.

Nothing that was ever poured out of a bottle from the store could touch that mixture as a relish. Of course the quantities can be increased as long as the proportion is maintained.

Here is about the best thing you or your wife can do with sliced green tomatoes: Cover with one cupful of salt and let stand for twenty-four hours one peck of green tomatoes, sliced, twelve onions, sliced. Pour off the brine and add: Six green peppers, chopped, one cupful fine-cut horseradish, one and a half pounds of sugar, a scant half teaspoonful of cayenne pepper. Cover with two and a half quarts of vinegar and boil until the tomatoes are tender and the green becomes translucent in appearance. Pack in jars with the vinegar. During the boiling of the mixture the following seasonings should be suspended in the kettle in a muslin or cheesecloth bag: Two ounces each of cloves, whole cinnamon, allspice and mustard seed. The idea of enclosing these

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things in a bag is to prevent the finished product of the jars from being too dark in colour.

The best test of the strength of brine suitable for pickling cucumbers is the newly laid egg. The brine should be strong enough to float it. The test will be surer if you keep hens than if you buy the “strictly fresh” at the store.

Make the brine by adding the required amount of salt to boiling water. Then pour the brine over the small pickle cucumbers after they have been packed in stone or glass jars. Let them stand twenty-four hours. Finally dry each one on a piece of cloth and put them all in the jars in which they are to be kept. For the pickling fluid for ten pounds of cucumbers take two quarts of vinegar and six pounds of sugar and boil, suspending in the mixture by means of the cheesecloth bags the same seasonings that are used in the pickling of green sliced tomatoes. When it comes to a boil skim off any impurities and pour over the cucumbers in the jars in which they are to be sealed.

When the particular gardener who happens to write these suggestions for his fellow gardeners throughout the country happened to remark, while

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he was hoeing tomatoes one day, that he thought he would write something about pickling, his wife sniffed and said something to the effect that it was a woman's job. Then she jumped at the chance to spread over the country her pet family rules, as printed above, dictated them to the gardener and examined his copy with great care to make sure that no mere man with a hoe should give bad advice to some trusting housewife.

Nine years ago the United States Government got together from various sources rules for ten different things that can be done with grapes. Then those ten recipes were carefully buried in the middle of a very large, forbidding-looking book, called the Annual Report of the Department of Agriculture for 1904, where the housewife is very sure never to find them. But as you have or should have a grape arbour near your garden, and as we are on the subject of putting things up for winter, it is worth while to drag forth these Government secrets. Here they are:

CANNED GRAPES. Select fresh, firm, ripe berries, remove the stems, and can the same as other fruit. The fruit of seedless varieties, such as the

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Thompson Seedless, is almost as good canned as when it is picked fresh from the vine.

GRAPE BUTTER. This may be made of either green or ripe grapes. If intended for a relish to serve with meats the green grapes are to be preferred; or, if ripe grapes are used, a little sharp cider is added. Pick the grapes from the stems, wash well, and put into a granite kettle with just enough water to keep from burning. When soft enough press them through a sieve to remove the seeds. To seven pounds of grapes, weighed before seeds are removed, add a pint of sharp cider, and, if grapes are ripe, two ounces of cinnamon and one of cloves. Tie the spices up in muslin bags and remove when the butter is made. Allow three and one-half pounds of sugar to seven pounds of fruit, but do not add it until the butter is quite thick. Boil it until it is of the desired consistency. Some prefer adding lemon juice instead of cider or vinegar; from half to two-thirds of a cupful would make the given quantity of grapes quite sharp. A pint of clear grape juice added to the strained pulp makes the best butter of all.

GRAPE PICKLES. Take seven pounds of ripe

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grapes and remove the stems. Take three pounds of white sugar, one quart of cider vinegar, one ounce of cinnamon and half an ounce of cloves. Boil this and pour over the fruit for two mornings; the third morning put fruit and all into the preserving kettle; heat so as to simmer for a few minutes, then put it into glass or earthen jars, tie up securely and keep in a cool place.

GRAPE JELLY. Select firm grapes, not quite ripe. Wash the berries well, pour into the preserving kettle and stew slowly for some minutes to free the juice. Strain through a colander and then through a jelly bag. Keep the juice as hot as possible. Measure the juice and add one pound of loaf sugar to each pint of juice. Boil fast, for at least thirty minutes, until done, and put in glasses.

SPICED GRAPES. Take the pulp of the grapes, boil and rub through a sieve so as to get rid of the seeds. Add the skins to the strained pulp and boil with sugar, vinegar and spices, using for seven pounds of grapes four and a half pounds of sugar and one pint of good vinegar. Spice quite highly with ground cloves, allspice and a little cinnamon.

GRAPE MARMALADE. Take one pound of grapes

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and one pound of sugar. Stew until well dissolved, put through a strainer bowl and then through a sieve. Cook until it becomes as stiff as jam. Put away in small preserve jars.

GRAPE LEATHER. Use same ingredients as for marmalade. Boil until quite stiff. Spread on marble slabs or china platters to dry.

GRAPE TRIFLE. Pulp two pounds of ripe grapes through a sieve fine enough to extract the seeds. Add sugar to suit the taste. Put into a trifle dish, and cover with whipped cream nicely flavoured. Serve cold.

GRAPE JUNKET. Take two quarts of new milk, warm it on the stove to about blood heat, pour into a glass bowl; stir into it two tablespoonsfuls of prepared rennet, two tablespoonfuls of powdered sugar, half a small wineglassful of grape juice, and half a wineglassful of grape brandy. Let it stand until cold, and serve with sugar and cream.

GRAPE PIE. Take the pulp from the grapes and heat a little to soften it; then rub through a sieve to get out the seeds. Add the skins. Sugar to taste and bake.

Drying fruit and vegetables to keep them through

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the winter is almost a lost art so far as the household is concerned, partly because the drying can be done better, with less loss of flavour, in specially constructed ovens run on a commercial scale, partly because of improvements in the process of home canning by which nearly everything that grows can be kept with much of its original palatable quality. In these days nobody would think, for example, of cutting up peaches and apples and placing the slices on boards to dry out in the sun, as our great-grandmothers used to do.

Still, home drying has its limited uses. It is the best process by which to keep Lima beans and shell beans. Let them fully ripen on the vines, and when they are so dry that the pods crackle under pressure of the thumb shell them and put them in damp-proof jars until needed.

If you canned from the early crop all the corn that will be needed, dry a little of the late supply for the sake of variety. Hang the ears, unhusked, to the attic rafters just as you would in preserving the best ears for seed purposes. When it is as dry as the ordinary pop corn or fodder corn it may be baked or boiled or parched.

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Drying, of course, is a very necessary process in the proper keeping of one of the garden staples — onions. They should be cured on the field if the weather permits, and then stored for the winter where three essential things can be assured — ventilation, dryness and a non-freezing temperature. As soon as the onions are pulled spread them on the ground in the sun, covering them night and morning to keep off dampness. Pick out all the imperfect thick necks, the soft and immature ones, and throw out all the loose skins, because these things themselves won't keep and may impair the perfect onions.

When thoroughly cured pack in crates made of wooden slats far enough apart to assure circulation of air, and then still further assure ventilation by placing each crate on sticks so that there will be plenty of open space beneath it.

In other words, use the same methods for keeping your small quantity of home-grown onions for the family table that the commercial grower uses. It pays. The groceryman will give you the crate.

CHAPTER XXIV



AUGUST—THE THIRD WEEK

MAKING a lawn should be the starting operation of every gardener's efforts to have his place in the country or the suburb something worth while on the score of looks. The best cultivated and most productive garden back of the house will hardly excuse a weedy, scraggly looking front yard. But, strange as it may seem, the two things often are found together — the good garden and the poor lawn or no lawn at all.

As a matter of fact the lawn should come first, especially if you have moved out of town for the purpose of getting more enjoyment out of life. To do anything in the way of new trees, shrubberies or even flowers before the grass plat is satisfactorily established is as illogical as hanging the pictures before the walls are papered or painted.

There is no better time for this lawn making than

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late August. Garden work is pretty well cleaned up. Now get at the grass and take plenty of time to do the thing right the first time, to get a lawn that will last for generations and improve in appearance each year. We hear a lot about the wonderful English lawns. One of the chief reasons why they are wonderful is that they are many years old and have never been neglected.

For the lawn seed go to the nearest reliable seedsman and tell him what your special conditions are as to soil, the amount of shade and slopes. Nearly every seedsman will tell you that his particular mixture of lawn seed is the best. They are all very much alike. But make some distinction in your buying between grass for the wide open stretches and for the places under trees where there is deep shade. There are varieties of seed for both shade and the open, so do not waste time and impair the future appearance of the place by putting one sort of grass where another sort would do much better. There are also varieties of lawn grass with specially long roots. Get one of these for any steep terrace there may be, as it will withstand washing out much better.

Perhaps the best thing to do as a preliminary is to

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go to the man who has the best-looking lawn in the neighbourhood, whose soil conditions are the same as yours, and ask him just how he did it, where he got his seed and what kind.

If the lawn is to be the setting it should be for the house it must fulfil three conditions: Refreshing colour, pleasing contour and satisfying extent. The greenness and velvety appearance of the grass plat, of course, are due directly to the quality of the seed used and to the preparation of the soil for it. As already said the selection of the seed, with the advice of the neighbour or the dealer, is a simple matter, but the preparation of the soil is just as important—more so, if anything, and more complicated.

Around suburban dwellings the real-estate dealer usually looks after the establishment of something that passes for a lawn in the eyes of the prospective home buyer as one of the assets of the property.

The city man, lured from his apartments, can, at the outset, look with delight upon the apparently promising greensward on his newly acquired premises. He does not realise then that with the first heat of summer his lawn will begin to burn up and

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that after a drought it will be an unsightly brown patch, which before another season must be labouriously and perhaps expensively renewed if there is to be any lawn at all the second year.

Grading and building operations and cellar digging for the house itself — with the consequent unavoidable bringing of more or less subsoil to the surface and the littering of the ground with fragments of bricks, mortar, splinters of wood and bits of roofing tin and other building materials — make the land about the house pretty poor lawn soil. The mere taking off of the rubbish that has not been buried a few inches underground, and the scattering of some seed, may be sufficient under these conditions to put a temporary covering of grass on the lot for real-estate advertising purposes; but investigate with a spade before you assure yourself that the work of making the real lawn has not all been left for you. If you build a house of your own see to it that the grading is done right in the beginning.

To be ideal the lawn soil must have a good supply of moisture always available for the grass roots. It must even up its own needs by the ability to drain off excess water in wet weather and to supply stored-

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up moisture from underground during the long dry spells. This quality in a lawn soil is far more important than the kind of seed sown or the choice of a fertilizer. Once establish this proper balance of moisture and all the other things necessary to that lawn will be added unto it.

The other essentials, that will take care of themselves to a very large extent if the water supply and the drainage are what they should be, are proper bacterial activity, aëration and oxidation, soil sanitation, and the supply of plant food. One can judge from that list how vital this moisture-conserving soil is in the making of a lawn. All of which leads up to the question: What is the right texture of soil for a good lawn? Should it be light or heavy, and how should it be treated to make it right if it is not so at the outset?

In general the light sandy soils, especially the coarser ones, are undesirable for lawns. They do not hold the water well enough. The heavier, clayey soils or clay loams are much to be preferred.

These clay soils, however, are more difficult to handle and also, as a rule, need plentiful liming to keep them from becoming sour and a great amount

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of manure or other organic matter for humus to loosen their compact texture. Still, the much better lawn that can be made on such ground justifies all the work of preparation.

If you could order this matter just to suit yourself you would have a top soil of rich loam, with a foundation of clay, not so impervious to water that there could be no draining off in periods of excessive moisture.

To do the very best thing with the ground you have, clean off every scrap of rubbish and get rid of the weeds. Then spade or plough to the depth of at least eight inches. If the place is big enough to justify the use of the plough it will be well worth while to follow it with a subsoil plough to break up the ground to a greater depth and add to the precaution against lack of both moisture and drainage. If the soil is thin incorporate a generous supply of old barnyard manure in it by spreading it on the surface and then turning it under.

The next operation is with the rake on the small place and the harrow on the big one. There cannot be too much of this fining process. The more rakings or harrowings the better. Hauling a drag of

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brush back and forth over the place will help, too, and after that use a smoothing board and roll the surface.

If at the beginning the soil has produced a crop of the weed known as five-finger, or if it has patches covered with a greenish, moss-like growth, that is a pretty good sign that there is too much acid in the ground for grass growing. Remedy that defect by working in a couple of bushels of lime for an area about twenty feet square. As a further precaution do not neglect to test the soil for sourness by means of the strip of blue litmus paper. Acidity is too easily remedied to allow the continuance of it to nullify all the operations of soil preparation and enrichment. For immediately available plant food to supplement the supply in the barnyard manure that has been ploughed under — partly as fertilizer but principally to loosen up the soil — here is the best chemical formula for a lawn twenty feet square: A mixture of one pound each of nitrate of soda, bone meal, acid phosphate and muriate of potash.

After the soil has been deeply dug, amply enriched and thoroughly pulverized on the surface, sow the

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seed. Let it be honestly cleaned and recleaned seed that is guaranteed, for the lawn is to be for all time. The mistakes in its construction are not like those in the vegetable garden — for a season only — and one mistake to be guarded against is getting seed that is full of weed possibilities.

Sow two quarts of the seed mixture for every twenty-by-twenty-foot area. It is best to sow one quart while walking back and forth north and south and the other quart while going east and west. That assures a more thorough and even distribution of the seed. Try to do the planting just before a shower.

After sowing go over the plat again with a rake or light harrow to make sure that every seed is covered, and then roll to compact and smooth the surface. With such thorough preparation of the soil and care in the selection of honest seed of the varieties best adapted to the needs of your particular place you should get a good start on your grass before growth stops for the winter and by next summer there will be a lawn that is a lawn. A coating of barnyard manure spread on the surface for the winter and raked off in the spring will be a great

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help. It will be an added protection against winter-killing in a severe season, and the plant food from the manure that will leach into the soil with snow and rain water will increase the richness of the ground.

In the spring the surface must be thoroughly rolled again to counteract the loosening effect of the heaving of the soil that comes with the alternate thawing and freezing which mark the end of winter and the approach of the mud season. Without this spring rolling the lawn will become lumpy and uneven and much of the grass will be apt to die because of exposure of the roots. Cutting next spring should begin when the grass is about two inches high. It should be kept at about that height by weekly cutting throughout the summer. That is short enough for looks and grass shorter than that on the ordinary lawn is apt to suffer from exposure of roots to the sun.

Do not rake off the cuttings. Allow them to rot on the surface and gradually become a benefit to the soil by giving back to it the plant food that they have used. Do not mow during periods of long-continued drought unless you can furnish an ample sup-

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ply of water for the grass by means of hose or sprinklers.

Perhaps you already have a lawn that is pretty good on the whole, but bad in spots—not bad enough to justify the digging up of the whole thing for a new start, but enough of a defect to make you feel a trifle apologetic when a caller comes round to look at your vegetable garden and flowers. In that case first learn what the trouble is. If it is too much shade get the seed adapted for such a spot. Test for acidity.

Maybe the soil at that particular spot was not prepared properly at the outset. When the trouble is understood apply the remedy, even to the extent of digging up the particular place that has made a bad showing and treating it as if you were making an entire new lawn, regrading and adding new soil.

Keep the lawn a lawn after taking all the necessary pains to get it. Don't chop it up with needless paths and fancy flower beds. True landscape work consists of a lawn that suggests spaciousness and of trees and shrubs and flowers to mark the borders or form groups in the corners, to form a vista or conceal an undesirable outlook.

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So far as possible give to the lawn or even the suburban grass plat the effect of extended area. See to it that necessary paths are enough lower than the general level to be invisible a few feet away, so they will not break the green expanse as you look across. And let the general contour of the lawn be convex — never concave — a gentle slope from house to road in proportion to the distance between the two.

CHAPTER XXV



AUGUST—THE FOURTH WEEK

LOOKING ahead for a period of years, plus consideration of the four seasons of every one of those years, is an essential preliminary to the planting of vines and shrubs and evergreens about your house and grounds, if such planting is to be permanently satisfactory. It is not a case of sticking something into the ground that will serve its purpose of producing food or blossoms within a few months and then be over with, never to be repeated in that particular spot if it has been a failure.

Permanent planting is as important as getting the house itself right. So don't jump at conclusions. Don't plant a particular bush or tree for no better reason than that somebody else has done it. Don't plant a particular shrub that you know is beautiful in the spring, until you know what it looks like in the fall and winter. Perhaps some-

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thing else, just as beautiful in the spring, has the added advantage of displaying wonderful scarlet berries all winter or a remarkable foliage that is worth while in itself, independently of the early blossoms.

If there are no trees and shrubs about the place when you take possession that is, in a way, an advantage. What you miss in shade and appearance for the first year or so is offset by the fact that you have a clean slate to begin with; that you can create your own surroundings; that you can make your place, for years to come, the expression of your own ideas and those of the family. It should be a family affair anyway. The members of the household should constitute a sort of home Department of Parks, with the man or woman best fitted for the job acting as commissioner, to carry out the agreed-upon plan.

Get a map of the place, front and back, in your head and sketch it on a sheet of paper. Sketch it many times. Get your distances as firmly fixed in your mind as the alphabet is — if you went to school in the days when the alphabet was of some account.

Visualize every nook and corner of the grounds as you see them from the road, from the back steps,

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from the front porch, from this and that window; as they look when the ground is covered with snow, when the buds are swelling, when the autumn colouring is at its height.

Go into the woods and the fields, in all four seasons, to look over the goods that Nature has to offer free of charge if you will dig them up and take them home; and consider this source of supply as well as the cultivated rows of the nurseryman before making the final decisions and purchases.

You can, for example, buy a pretty good dogwood tree from the commercial grower for two or three dollars, but you can get one just as good from the edge of the woods for nothing, and it means more to you after you have got it. Every season thereafter, when that dogwood blossoms, you will tell how you went out into the woods and dug that tree yourself. As you get old your children and grandchildren will sit round on the porch spring evenings, watching the level, flower-laden branches of the dogwood tree that look like shafts of moonlight against the dark background of the evergreen foliage, and wait for your annual story, knowing that it is sure to come. In the course of years, either with your

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own telling or with the handing of the story down by the next generation, a dangerous snake will glide into that tale, or a terrific tempest, with the tree right next to the dogwood struck by lightning while you were at work, and everybody will believe it. So the place will have a tradition as well as a tree — and every family should have traditions.

But mere planning and dreaming about the matter will not plant the trees and shrubs. There is a digging period as well. If the place is hilly don't be too eager to level away every knoll there is for the sake of getting the conventional flat lawn, with hedges round the border and shrubberies in the corners. The very unevenness of the ground, if treated properly, may develop into one of the chief sources of its charm and attractiveness. That is one of the problems you must solve for yourself before the final adoption of your plan.

Trees that are to grow large, like the pines, must not be crowded. If the upper branches finally come in contact one of the trees is going to suffer, perhaps die. Neither should such a tree be placed where it will eventually touch a building or reach too close to it. That would mean the dying out of

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the tree on the side toward the house. If such a tree is to live on for generations and be a greater ornamental asset each year it must have a wide area, preferably a lawn, that it will eventually shade and dominate.

The proper business of the vine is not only to be beautiful itself but to hide something that is not beautiful, no matter how useful and necessary it may be. It is time enough to make pergolas and other supports of vines, if you really want them, after a good start has been made in trailing the ivy or Virginia creeper or wistaria over the barn and woodshed and such other service buildings as there may be on the premises.

For the general layout of the grounds there are two things to consider broadly, each of them subject to many subdivisions. These are the utilities and the æsthetic things. Under the first head come your path and roadways, the tennis court and croquet ground, the vegetable and flower gardens and, for the sake of appearances throughout the country, it would do no harm to include the space for that homely but necessary business of hanging out the week's wash.

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Let the clothes yard be a close-cut lawn, for the sake of cleanliness, and then inclose it with a high hedge or a continuous arbour covered with a vine. The community as well as the family should be considered in the laying out of a place. When Arnold Bennett was being shown about this country one of the things that struck him was the very general clothes-line display. To express his opinion of it he parodied a line from a famous poem and spoke of "the short and simple flannels of the poor."

Paths and roadways should be direct and take up no more space than is necessary to serve as a means of getting somewhere. Don't curve a path merely for the sake of having it curve. If you are set on having something other than the short, straight line, put a tree or a bush in that line so there will be a real excuse for having the path make a turn from its natural course.

Privacy out-of-doors is another thing to be sought in the planning, and that arrangement of the hedges and shrubberies should be such that there is at least one space where the family can enjoy the delight of a meal in the open air without the passing public's having to know, in spite of it-

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self, whether the roast beef is rare or well done, whether the small boy of the household has or has not yet acquired good table manners, and whether the old man can carve a chicken without looking things that he ought not to say, either in the house or out of it.

Under the head of the æsthetic comes the general ornamental effect of the whole plantation, as seen from the road and the house, and the quality of each separate shrub and tree to satisfy your love of and interest in leaves and flowers and bark. Both of these requirements are to be fulfilled by the right selections, and there are countless combinations that will do it.

Here is one such combination that would fill a space of from 225 to 250 square feet, without special references to the shape of the plat. It may be round, square, rectangular or, best of all, somewhat irregular. The general rule in this group planting of shrubs and small trees for mass effect is to determine approximately the number of plants by dividing the total number of square feet by 12 or 15. That would give about sixteen separate pieces for the area:

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One forsythia bush	One spiræa Thunbergii
Two golden philadelphi	One dogwood
One laurus benzoin	One English hawthorn
Three plants of the bush	One viburnum dentatum
honey-suckle of different	One viburnum tomentosum
colors of foliage	One weigela, Eva Rathke
One spiræa Van Houttei	Two tamarisks

Such a combination would give white, yellow, pink and crimson in the flower colours. It would provide for bright berries in the winter and a fine show of foliage between flowering time and the falling of the leaves, and there are some attractive barks in the collection. There are other groupings that would give a more gorgeous colour show for a small fraction of the year, but that is not all there is to the permanent shrubbery planting. The flower gardens are for colour primarily. The other things are for winter as well as summer.

All of the plants in the above list may be set out in late September or in October or early next spring—any time, in fact, when the plants themselves are dormant and the ground is workable.

The soil should be prepared for them with as much care as you would prepare the ground for the vegetable or flower garden. For thoroughness the ideal way is to spade the required area to a depth of three

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feet. If the soil is good to that depth it can all go back with a liberal supply of barnyard manure incorporated in it. If it is not good it will pay in the end to put in good ground from some other part of the place. One-sixth of the total mass put back after the spading ought to be manure. To save time this may be put in in two or three layers, but it is better to work it all through the soil. Such preparation is going to store up a supply of rich plant food for a long time to come, immediately available for the roots. The digging up of the place, instead of merely making holes for the separate plants, is going to assure good tilth that will conserve moisture and give the plants the very best of conditions under which to get a good start.

Supplementary fertilizing will be needed, of course, every year and this is best obtained by mulching the ground late in the fall with a heavy coating of manure and digging it in the spring. Cultivation is also necessary through the growing season, just as it is in the ordinary garden. And the annual care must include careful pruning. Remember that the only time to prune a flowering shrub is immediately after its blossoming period is over. Also remember not to cut out the berry-bearing parts.

CHAPTER XXVI



SEPTEMBER

WHEN to pick the fruit, and what to do with it to get the greatest good from it for the longest time, are two of the problems incidental to the fruit garden almost as important as the matters of planting, cultivating, pruning and spraying. To do all the preliminary things as they should be done, and then to impair the flavour and keeping qualities of the crop by not knowing one or two little tricks of the harvesting and preserving, is unfortunate. Yet it frequently happens. Of course for immediate use — for eating as you stand under the tree or vine entertaining a friend and showing off your garden, or for fresh fruit at the table — the obvious rule to pick when just ripe needs no setting forth.

But that is only part of the game. If the fruit garden is anything of a success it will produce enough to last over for the following year if properly put up.

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So the rules are necessary. Grapes, for example, should be picked when not more than three-quarters ripe for one purpose, when fully ripe for another, because of chemical changes that come with the development of the fruit. Pears may be kept for weeks, sometimes until Christmas, in their natural form as fresh fruit if they are handled right, and this without loss of flavour.

To accomplish this pick the pears when they are firm and of good colour, but long before they are ripe enough to eat. Wipe each one clean and dry and wrap separately in pieces of oiled paper. Then put them away in a dark, dry, cool place; and you will have fresh pears to eat for a long time before it is necessary to open the first jar of those that you have preserved or pickled.

September sees the close of the greater part of the season's canning, pickling and preserving. Grapes, late blackberries, pears, peaches and quinces complete the list of fruits other than the ever-useful apple. It is the apple that saves the situation when other fruits are a failure, for with sweet apples pickled after the rule of our grandmothers' apple butter, and a stock of canned apple sauce, together

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with a winter's supply of Baldwins or other good keepers in the cellar, there is no reason why the family should not have an ample and wholesome fruit addition to its diet all through cold weather. If you happen to be raising your first pig for your own roast pork you will, of course, not make the almost criminal mistake of not having your own apple sauce to go with it.

Then there is the homemade cider to drink and for the pies, also the cider jelly to go with cold meats, as useful by-products of the tree or trees. When there is an off-year with the fruit be sure to save the windfalls. They are just as good for cider and for apple sauce as hand-picked fruit.

The later peaches, which are not so mellow or full flavoured as the early ones, are best spiced. The same is true of many varieties of coarse-fibred, rather insipid pears. The pears must be peeled, but the peaches need only have the "wool" thoroughly wiped off. The following pickling rule is equally good for peaches, pears, quinces, blackberries or sweet apples:

7 pounds of fruit

4 pounds of granulated sugar .

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1½ cups vinegar — dilute if very sharp

1½ ounces whole cinnamon

¼ ounce clove; or one clove stuck into each fruit

The spices should be sewed into a muslin bag and suspended in the kettle to prevent too great darkening of the syrup. Put the vinegar and sugar and spices on to boil until the sugar is dissolved to form the syrup. Then add the fruit and after it has boiled up well draw back on the range and allow to simmer slowly until the fruit is thoroughly cooked. It will be tender and finely seasoned, the flavour of course growing richer the longer the fruit remains in the spiced syrup.

The old way was to keep these spiced fruits in stone crocks, but it is better to keep them in glass quart jars which hold the right amount for a family's use. This does away with the continual stirring over of the fruit every time it is taken from a crock and the consequent broken pieces caused by many handlings.

Here is a recipe for peach marmalade that is worth trying: Pare and cut the fruit. To every pound of peaches add three-quarters of a pound of sugar. Put the fruit and sugar into a porcelain-lined kettle

and let it come to a boil. Then draw the kettle to a cooler part of the stove and add the juice and shredded pulp of a medium-sized, very ripe pineapple and the juice of two lemons. These quantities are enough for a twelve-quart kettle of fruit. Cook this several hours until it becomes a thick, pulpy marmalade, taking special care that it does not burn. Pack the mixture in glass jars and seal them with paraffin.

For grape jelly the following rule has been used with great success for four generations in at least one family: Pick the grapes when they are about three-quarters ripe. Stem and wash them and put into a granite kettle. As the fruit heats crush it with a wooden potato masher. Boil the crushed fruit gently for half an hour and then pour the whole — juice, skins and pulps — into a cheesecloth bag of double thickness which has been moistened in cold water. Let the juice drain through the mesh of the cloth overnight into a kettle. Measure it in the morning and for every pint of grape juice allow a pound of granulated sugar. Put the sugar in granite pans, place in a moderate oven until thoroughly heated. Meanwhile put the juice in the kettle over

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the fire and boil for twenty minutes. Then add the sugar gradually, stirring it as it goes in to quicken the process of dissolving. Let the sweetened juice boil up again and then skim it. For a test take out a teaspoonful and chill it on ice to see if it "jells." The less the mixture cooks after adding the sugar the better the jelly will be in colour and flavour; so as soon as it shows a tendency to thicken on the ice turn it quickly into the chilled jelly tumblers. Cover them with clean paper until the jelly hardens, then seal with paraffin.

The reason unripe fruit is required for the jelly is found in the pectin, a carbohydrate somewhat similar in its properties to starch and found in all fruits. It is the pectin that makes the juice stiffen into jelly when equal quantities of the juice and sugar are boiled together. This pectin is most active before the fruit is ripe. It loses its power of gelatinizing with complete ripeness or if the juice and sugar are allowed to ferment or are cooked too long.

Another point to remember with reference to this pectin is that grapes and other fruits to be used in jelly making should not be picked immediately after

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a rain, for they absorb much water which dissolves the pectin before it has a chance to do the work of hardening the product. For the same reason any necessary washing of the fruit should be done as quickly and with as little water as possible before the jelly making begins.

Putting up jelly is not such a risky or painstaking job as the canning of fruits or vegetables, because jelly is so rich in sugar that it is practically immune to bacteria and yeasts. But it must be well protected against the spores of mould and against evaporation. Here are different ways of accomplishing the same thing: Prepare rounds of thick white paper, the size of the top of the glass, and dip them in brandy or alcohol. Also brush over the top of the jelly itself, as soon as it is hardened in the glass, with alcohol or brandy and then cover with the dipped paper circles. If there are no metal or glass covers for the jelly tumblers cut another set of paper circles with the diameter half an inch larger than those of the tops of the glasses, so they will overlap all round and admit of being pasted down to the sides of the glass. To get the paste beat up the white of an egg to which has been added a tablespoonful of cold

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water. Another way is to dip the paper covers in olive oil and then tie them on to the glasses.

The paper dipped in alcohol really makes a safer cover than paraffin, because the alcohol destroys any mould spores that may be on the jelly when it is put up. If they happened to be there when paraffin covers were put on they would simply develop under the casing and spoil the whole jar. Of course there is no objection to taking the double precaution of having brandy-soaked paper on the jelly and the paraffin over that. If paraffin is used alone let the coating be at least a quarter of an inch thick, for as it cools it contracts and if the layer is too thin it will crack and expose the surface of the jelly.

STORING OF ROOT CROPS.

Whether or not the first cost of fixing the cellar so that it is suitable for the storing of vegetables is more than offset within the first winter by the saving on the household food expense account depends, of course, upon the amount of carpentering or masonry work that must be done and upon how many vegetables the family uses between growing seasons.

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That it will pay, and pay well, in dollars and cents in the long run to raise in your own garden enough vegetables and fruit for the entire year and to have a satisfactory place for the storing of the root crops, the celery, cabbage and apples, there is no question. It pays from the very outset in the immense satisfaction in being a real producer, even if the consumers of the product are limited to the circle about your own dinner table. It means a greater abundance of vegetables and fruit, a much greater variety, and far and away better quality than when everything is bought.

That patch of ground back of the house becomes much more than a place for exercise and diversion or a source of summer and autumn table delicacies. It remains all of that and becomes, in addition, a very real factor in the cost of real living.

There are three essentials for the successful storing of fruits and vegetables—dryness, good ventilation and the temperature best suited to the particular thing stored. Unfortunately the same temperature is not the best for all things. If it were the problem would be simpler. Sweet potatoes, for instance, should be kept in a dry, comparatively warm

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room, with a temperature of between fifty-five and sixty degrees — about the same amount of warmth required for the raising of mushrooms. But that, of course, is altogether too warm for the white potato or any of the other root crops.

On the other hand, good winter-keeping apples of the thick-skinned varieties will do well in a temperature a trifle below freezing. Northern-grown, hardy apples — the Spitzenburgh, for example — may be frozen hard without material harm if they are kept frozen till they are wanted and then thawed very gradually.

It is between these extremes of the sweet potato and the very hardy apple that the safe average temperature for nearly everything is found. The ideal would be just above freezing, but if you can maintain an average of anywhere between thirty-two and forty degrees you have an excellent storage place so far as temperature is concerned. But it must be dry, too, and have good ventilation.

After providing these three requirements there is another thing fully as important — the quality and condition of the product that is to be stored. It should be sorted out and selected with as much care,

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as much rigid rejection of the imperfect, as you would exercise in making up an exhibit of fruit or vegetables for showing at your county fair or in filling a gift basket for a friend. Not a single fruit or vegetable that is bruised or soft or cut or in the least affected by plant disease should be given place in the storage quarters, for one imperfect piece may cause the spoiling of the whole lot.

Possibly your cellar is all right as it is to answer the purpose, or can be made so with very little tinkering. Such a simple thing as wrapping with asbestos the steam or hot-air or hot-water pipes between the top of the furnace and where they go through the cellar ceiling may be all that is necessary to reduce the cellar temperature to the required degree, and incidentally to give you more heat upstairs. Or the desired results may be obtained by nothing more expensive and elaborate than a cloth screen or a partition of light wood to separate the section chosen for the vegetables from the furnace and coal bins.

Onions are perhaps hardest to keep successfully through the winter. The manner of harvesting is of great importance. The onions must be pulled

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promptly as soon as they mature — that is, as soon as most of the tops begin to wither and turn yellow. Onions in the same row vary more or less in the time of maturing, but a few green ones will not matter. The onions from three or four rows may be heaped together in a windrow to cure for a week or ten or twelve days.

If one is reasonably sure of clear, dry weather the onions are best left right on the ground, where the curing process may be hastened by occasional gentle stirring with a wooden rake. Be sure that the stirring is gentle and the rake a wooden one, for the slightest bruising of the bulbs, especially of the white varieties, causes them to decay rapidly and the most careful storing will not save them. Thorough curing prevents sprouting, and careful handling prevents decay, so these two precautions are essential.

It is best to top the bulbs when ready to store, leaving about an inch of the stem. The ordinary cellar is, as a rule, too moist for the safe keeping of onions. Bins or boxes in a frost-proof shed or barn, or a dry loft, should prove satisfactory. The temperature must never drop to freezing, but on the other hand

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it should never rise more than two or three degrees above it. On bright days, when it is not too cold, the windows should be opened for ventilation, care being taken never to let the sun strike directly on the bins where the onions are stored.

In the matter of onions you may get one of the best hints from the commercial packages in the stores. The vegetables are packed in crates of light wood strips that afford ample ventilation. There is no better way of putting up the supply from the home garden. When the crates are put into the storage room raise them from the floor of the bin and separate them from each other by blocks of wood placed under the ends so that the circulation of dry air may be through the bottom of the crate as well as through the sides.

With the cellar temperature and ventilation what it should be, there is no better way for the successful keeping of the potato crop than to spread the tubers out in the bottom of a wooden bin, raised a foot or two from the floor. The thinner they are spread the better, the ideal condition being to have no potato touch another. Twelve bushels — a good winter supply for a family of four moderate potato eaters

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— may be stored in comparatively small space, and as the quantity diminishes the lot may be spread out thinner.

If your crop of celery is small, and you expect it to last only through the late fall, it will be necessary only to heap the earth round the base of the plants in the garden, leaving them thus exposed until real danger of hard frost. Celery will stand very cold, frosty weather without coming to harm, but once it actually freezes its flavour is spoiled.

When freezing weather is at hand the earth must be heaped closely up to the very tops of the plants, until it almost covers them, and as the days become even more severe this ridge of banked celery should be well covered with coarse straw or stable manure held in place by boards or stakes. Do not use decaying leaves for banking or let any manure come in contact with the stalks, for celery readily absorbs odours that are present in the storage place, and its edible qualities may thus be ruined.

Another way of storing celery out-of-doors is that known as trenching. A narrow, shallow trench is dug, and as soon as there is danger of heavy frost the celery is dug and placed with the roots bunched

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close together in this trench, the sides of which should be inclosed with two parallel rows of blanching boards. The earth is now heaped up on both sides and a covering of boards or straw put on over the whole.

Where celery is kept out-of-doors the natural circulation of air through the trench from end to end should be regulated with reference to the wind and outdoor temperature. On warm days both ends of the trench should be opened. On days of extreme cold both ends should be closed with straw and earth. On moderate days the end opposite that from which the wind is blowing should be opened.

If the cellar is cool and dry you may safely venture to store your winter's celery supply there. The temperature, however, must be very low and the ventilation good if you expect satisfactory results. When using the cellar for storage take up the plants with most of the roots attached and set them in a deep bed of moist sand.

Cabbage and turnips should not be kept in the house cellar for the reason that they are liable to decay and become offensive, if not even dangerous to the family health. The winter's supply of these two vegetables

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can best be kept in boxes half buried in the garden. Choose compact, perfect heads of cabbage, and handle with care to avoid bruising. In the same way choose the firmest and most perfect of the hardy turnips, and then take pains to keep their surfaces unbroken. The storage boxes should be sunk fully half their depth in a dry part of the garden, and then the bottoms of the boxes covered with some six inches of dry earth, on which the vegetables are placed heads down and covered with from six to ten inches of soil. This covering is put on lightly at first to avoid heating, and may remain so until severe weather is at hand. Then a good covering of straw or coarse manure should be added.

With a little more digging the boxes or barrels may be eliminated from the cabbage-storing arrangement and this vegetable carried in safety through the winter by the trench system alone. Make the trench three feet deep, which in any ordinary winter will be safe, store the cabbage heads in it and then mound up with earth, covering the whole with straw, held in place by boards, as an extra precaution.

Beets, carrots, parsnips and oyster plant may be easily kept in a cool, dry cellar if packed care-

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fully in boxes of sand. They must be handled carefully, only perfect ones saved, and then placed so that the roots do not touch.

Squash must be kept in a dry place where one can be sure of a uniform temperature of about fifty degrees, and even the squash with its thick skin must not be handled roughly.

CHAPTER XXVII



SEPTEMBER—CONTINUED

WHEN you think you have made good and sensible use of every part of your ground, so far as the permanent layout is concerned, think again. The chances are that you will find place for another grapevine, perhaps for half a dozen, thus adding both to your crop total and to the general appearance of the entire place. The grapevine, well cared for, is beautiful as well as fruitful. But for it to be both there must be a compromise scheme of give and take between the fruit on the one hand and the wood and leaf on the other.

That is a point to remember in planning for the grapevine planting. If an arbour is wanted to furnish shade, or if the vine is intended to serve as an arch the length of a walk or as a screen against a wall or to form a summer house with walls and ceiling of broad green leaves, the grape will serve any

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or all of these purposes, but it will not produce much in the way of full-grown clusters of well-developed berries. Its fruits will be incidental — thin, scraggly bunches, hanging here and there from the top of the arbour, furnishing enough fruit, perhaps, when all is gathered, to help out on the jelly making, but not much to look at as fresh-gathered for the table. That is one extreme — the maximum of shade and the minimum of fruit. But if there is plenty of room a yard should assuredly have some such grape arbour because of its attractiveness.

The other extreme is the scientifically pruned and trained vine, with its canes cut off and cut back with reference only to the best results in the size and weight of the fruit clusters. Several such vines as this must be on every place if the owner makes any pretensions to being the grower of his own fruits and vegetables. They are more important than arbours and have the first call on the room space if there is not enough for both.

But the sort of vine we had in mind at the outset was something in the way of a compromise — an extra piece put in here and there as a filler when the ground seems to be filled up but really isn't. There

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is room for one, no doubt, in some awkward corner where it will serve its ornamental purpose and still admit of enough annual restraint on its wood growth to furnish some good fruit too.

Another vine will make an excellent screen to blot out, or at least blur, the too conspicuous view of something unsightly on your own or your neighbour's land — a chicken coop, for example, made out of an old piano box which an amateur poultryman has neglected to paint.

In the vegetable garden itself a string of vines can be put along the western edge, where they will not rob other things of the morning sun, at eight-foot intervals. A vine or two on the eastern border will not do any harm if the placing of the vegetable plants is regulated accordingly. The friendly shade of a grapevine has often saved a bed of lettuce or a patch of green peas from the July sun.

That there are about two hundred different insect pests that prey upon the grapevine, take it the world over, is more than offset in the United States by the fact that the worst of those pests are found only in the grape-growing regions of the Mediterranean countries, that the insects prevalent in this

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country are easily controlled, that the vine responds more readily than other fruit-bearing plants to good care and generous food supply, and that it will grow almost anywhere.

There are two very simple methods by which you may increase your number of vines from those you already have or from some favourite variety of a neighbour. Neither way costs more than a very little trouble. One method is to reproduce from cuttings; the other is by layering.

Cuttings may be made this fall, as soon as the vines become dormant. Or the preliminary work can be done early in the spring. Better do it this fall. There will be a thousand and one other things to attend to in the garden as soon as the new season starts. Furthermore the bulk of opinion on the part of the big vineyard growers is in favour of fall cutting. The writer has vines started from cuttings taken from the parent plant at both seasons, and the fall-cutting productions seem more thrifty.

A grape cutting is a length of well-matured last season's new wood. A piece eight or ten inches long is about right. Select medium-sized wood with short joints. Make a slanting cut just below the bottom

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bud or eye of the piece removed and then trim off the upper end, leaving an inch of wood above the upper eye. It will help to have a small piece of the old wood left on the lower end. If the cuttings are made this fall they may be tied together in a bundle and kept in cool, moist sand in the cellar through the winter. Or they may be planted outdoors this season at any time before the ground freezes, but it is safer to postpone the outdoor planting until spring.

An excellent trick of the commercial grower, which you may adopt to advantage, is to put the cuttings in the ground but ends up when you trench them temporarily. This causes the root ends to callus, while the tops remain dormant. Then when they are planted in spring the throwing out of roots begins immediately and gets ahead of the top growth. If this precaution is not taken the tops are apt to begin their growth before there is sufficient root.

When the cuttings are finally set in the ground in which they are to have their first year growth they should be put in right end up and planted so deep that only the top bud is aboveground. Ground should be well prepared and made mellow to a depth of fourteen inches and then frequently cultivated

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throughout the first season to assure conservation of moisture. Six-inch intervals between the new vines are sufficient. After their first year as independent plants they will be transferred to the place where they are needed in your scheme.

There is a variation of this plan, called the short-cutting method, which requires more pains but which some authorities claim produces better vines. One of the short-cutting advocates is Prof. S. T. Maynard, of the department of horticulture in the Massachusetts College of Agriculture. The short cutting, he says, should consist of a single bud, with only two or three inches of wood. It must be rooted in sand by the aid of artificial heat. Make the cuttings in winter and put them into boxes of sand one or two inches apart. Furnish heat in the bottom of the box by a layer of fermenting stable manure, or else get the same result by placing the box on hot-water or steam pipes. The desired temperature of the soil in the box is from fifty to sixty degrees, says Prof. Maynard, and that of the surrounding air should be from forty to forty-five degrees. When well rooted the cuttings are transplanted to other boxes or, if the danger of frost is over, to the open ground.

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Layering may also be done this fall or in the spring. It is the easiest possible way of getting a lot of new vines from an old one and it will succeed with more varieties of the grape than the cutting method.

Select a long cane of last year's new wood, starting near the base of the trunk of the vine. Dig a trench two inches deep from the stem in the direction the cane grows and as long as that cane happens to be. Then bend the cane over and pin it down in that trench for its entire length. About every bud on that cane will produce an upward-growing shoot. As soon as the shoot starts fill in the trench with soil, and then for every shoot a root growth will start downward, producing a whole string of new grape plants, all getting nourishment from the layered cane like a litter of pigs from a sow, as well as from their own new roots and tops. When the growth is well started the layer is cut between each two new plants, and the young vines are taken up separately and transplanted.

A man with a good grapevine from which he wants to raise many others, either for himself or to sell or give away, can look ahead a season or two, and by letting a new shoot grow until it becomes next year's

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cane he will have the source of another string of vines from the desirable stock.

Supplement the reading of these paragraphs on cuttings and layering right now by going out for a look at the nearest grapevine. The difference between this year's shoots and the canes, which were shoots last year, and of the arms and trunk of the vine will be very obvious. So also will be the matter of eyes or buds and the suitable location of canes for layering purposes.

Successful grafting for grapes is a difficult matter, much more so than for the tree fruits; and with the two simple and practically sure methods of cutting and layering at your disposal the only excuse for adopting the third way of propagation is the commendable one of wanting to try all the experiments that are possible in your garden.

For grafting purposes the scion should be well-ripened, short-jointed wood of medium diameter. If any time elapses between the cutting of the scion and the operation of grafting it should be kept in a cool place where there will be no danger of its drying out. Three or four weeks before the union is made cut off the stock two inches above the point where the

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graft is to be made so it may bleed thoroughly. The next step is to cut off the stock near the surface of the ground — a trifle below the surface if it is desired that the grafted part put out roots of its own.

Make a cleft in the smooth-cut surface, cut the lower end of the scion to a smooth wedge, even slants on both sides, and then insert it in the cleft, pushing the wedge down until the bottom bud is just above the cut-off surface of the stock. The principal thing to look out for is that the inner bark of the scion is in contact with the inner bark of the stock. As the scion is smaller than the wood into which it is grafted, two scions may be put into the same cleft, one on either side, so that each will get the absolutely essential bark contact. The principal reason for inserting two scions is that you double your chances of success in an operation that is by no means sure. Wax the cut and cover the entire thing with earth as a further protection. This grafting may be done in the fall.

Professor Maynard would make the cut on the stock below the surface, use no wax, but cover the operation with soil up to the top bud of the scion, and place over that earth a flower pot. Above the flower

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pot he puts more earth, a foot of it, and then covers that with litter. This is to prevent the ground about the graft from freezing. The flower pot is merely a protection against rough handling of the scion in the spring when the outer covering of earth and litter is pulled off. A single bud, he says, grafted in this way on a stock less than three-quarters of an inch in diameter, made a growth of two canes, each more than eight feet long, in its first season. Good fruit may be expected the second year.

To make a very effective chemical fertilizer for eight grapevines take one pound of nitrate of soda, six pounds of bone meal and fifteen pounds of wood ashes; mix them thoroughly and then work into the soil around the plants for a distance of four feet.

CHAPTER XXVIII



OCTOBER AND NOVEMBER

OCTOBER is no month for loafing in the flower garden. What with taking up the tender bulbs to save them from winter killing and putting out the hardy bulbs to assure early flowering in spring, there is much important and interesting work to be done away into next month. The time limit for effective work depends of course upon the date of the first hard frost for the region in which the garden is located.

Not only are hardy bulbs to be put in the ground, but practically all the herbaceous plants may now be set out to advantage. This applies to the perennials — the larkspurs, for example, or the sunflowers, the anemones, and practically all the old-fashioned plants. The tops of all of them will die down with the first severe frost, but the roots will make growth all winter, except in the occasional intervals of extreme cold,

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and will be ready for an early and thrifty start at the very outset of spring. To leave the preliminary work till spring means that you will then have to wait till the ground is sufficiently dried out to work, and a very material delay in the getting of blossoms will be the result.

Work with roses offers the exception to the rule, although some of the hybrid perpetuals may be set out before frost; but even with these it is better to wait until spring.

Some of the bulbs must be removed from the ground as soon as their tops die down with the first touch of frost—notably the gladioli, the dahlias, the cannas and the tuberous-rooted begonias. These things are as tender as oranges and the bulbs will stand no frost whatever. They should be taken up and packed away for the winter in dry, clean sand, in the cellar, where there is no risk of their freezing.

The montbretia may be left in the ground except in the northern parts of the United States, but it should be protected with a covering mulch of straw. Of course in the Southern states the gladioli and dahlias will live in the ground throughout the year if heavily mulched, but even here it is better to take

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them up so they may have the complete rest of a dormant period.

Bulbs to be put out this month and next are the tulips and the hyacinths, the daffodils, jonquils, and the various other narcissi, and the snowdrops, crocuses, and bulbous-rooted irises. Inasmuch as all these will live in the winter in the open ground they would also survive through the summer, so the amateur gardener may naturally ask why take them up at all, thus adding to the garden work by removing bulbs in early summer after their flowering period and restoring them to the ground in the fall. The answer, so far as the tulips and hyacinths are concerned, is that they need a rest. Without taking up and transplanting they would be of little use after the first year. At best they make a poor showing after the second or third season, even when removed and put back each season, so the bulbs of these two particular plants should be replaced with new ones after three years if the quality and brilliancy of the beds are to be maintained.

In spite of this comparatively short life of the tulips and hyacinths there are probably hundreds of these plants put out the country over as against

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dozens of the narcissi, which improve year after year the longer they are grown. Furthermore the narcissi do better if left in the ground undisturbed throughout the twelve months. The only reason for taking them up is to make room for annuals and to provide for rearranging of the spring beds.

Like the tulips, the Spanish and English irises need frequent renewing. The herbaceous iris increases in quantity and improves in quality as the years go on, and it is not necessary to take it up.

Evenness as to depth of planting and uniformity of type in the same group are the prime essentials in making satisfactory beds of tulips and hyacinths, whether they are in borders or more formal designs. In the first place let the soil be well prepared and thoroughly enriched with manure. It should be spaded up for a depth of a foot, made fine throughout that distance, and freed of all rubbish and small stones which would interfere with the placing of each bulb just where it ought to be to produce its part in the effect.

A continuous display from the earliest to the latest possible flowering date of the tulip is what you

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want, and the successive groups which fill up the season must be made up of plants of the same height. Tulip growing has been reduced almost to a mathematical science, so the exact size wanted is to be had for the asking.

Unless you know all the ins and outs of the matter from long personal experience or with the assistance of an accurately kept personal diary, the proper selection of the tulip varieties is a simple matter of catalogue reference and consultation with an honest dealer. In this way you will get in one group the eight-inch tulips, in another the ten-inch, in another the plants that lift their flowers a foot above the ground. Again you will have in one group the early flowering types, to be followed in their respective weeks by the late-flowering Cottage, Darwin and Dragon varieties. After these come most of the double flowers.

Plant the tulip bulbs about four inches underground. Bury the iris bulbs about one and a half times their own depth. Just cover the hyacinth bulbs — not much deeper in the ground than you would put onion sets — with their points just showing. The iris is a weak-stemmed thing and should

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be put among other plants that will help hold it up when it begins to make its spring growth.

None of these bulbs should come in direct contact with barnyard manure. If possible have your stratum of the enriched soil just below the level at which you place the bulbs. If this requires too much time and trouble, or if the whole soil is filled with manure after your enrichment of the garden throughout the summer, you must take the precaution to place in the bottom and round the sides of each hole a little clean sand or loam as a protection.

Be sure to avoid manure as a mulch for the hyacinth, because if it rests upon the crowns of this plant it will cause decay. In this whole matter of winter mulching there is danger of overdoing. Except in periods of extreme cold the natural soil temperature of the season is best for nearly all the varieties of tulip and hyacinth. At most they need only a slight covering of straw or leaves. One exception to this rule is the Mariposa tulip. This and all the anemones and the midsummer flowering montbretia should have good protection.

One more warning against using manure as a winter cover: It should not be placed over such her-

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baceous plants as the foxglove, Canterbury bells, and the madonna lily; it would surely rot them.

Root division is the method by which the peony is multiplied. Split up the old large root this fall and plant the parts not deeper than one or two inches. A very common mistake is to set the peony too deep. This is a plant that can be heavily mulched with manure, not for winter protection, because it does not need that, but to enrich the soil, which it does need regularly.

This rule to split up the root clumps and set the parts in different places as soon as the plants have done flowering also applies to the autumn-blooming asters, the phlox, chrysanthemums, and practically all the herbaceous perennials. It may retard the blooming of the peony in the first season after the root division is made, but it is necessary nevertheless. With the other plants the improvement in flowering will show the very next year after the splitting up of the big clump. Phlox roots should be divided every third year anyway, as soon as frost has killed off the tops, if they are to be at their best.

The three graces of the autumn flower garden are the dahlia, the aster and the chrysanthemum. The

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first two require rich soil in which to thrive; the last is content with somewhat ordinary ground. Each of these plants needs plenty of room for its individual growth. It seems a mistake to force these particular flowers, as some gardeners do, to obtain early blooms. The more desirable method is to remove the early buds and pinch back the blossoms, thus reserving their rich colours for the late garden bed when other flowers have gone by.

The dahlia and aster will need some protection as the frosty nights draw near, but the chrysanthemum will endure a greater degree of cold, and if you are so fortunate as to have some of the little, old-fashioned "button" chrysanthemums they will be blooming bravely even when snow flies.

When frost has actually nipped the tops of the dahlias let the plants remain in the ground another week, then dig up the tubers, dry them, and put them away in a place that is airy and cool, but also dark and dry. In such storage they will keep in the best condition for next spring's division and re-planting.

Any flowering plants that one has been keeping in sunken pots in the garden, pinching off the buds

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as they appear so as to reserve the strength for winter blossoms indoors, are better off out of doors until actually threatened by freezing. But all bulbs, such as tuberose, cannas and gladioli, must be out of the ground and safely stored before freezing weather. It remains now for the gardener to do his fall cleaning, raking off old stocks, digging and raking the border, which will save valuable time next spring. Roses and tender vines must be protected by wrappings of straw; the newly planted bulb beds should have a blanket of litter or leaves sufficient to keep out all frost.

October and November are also full months in the business of pruning hedges and the autumn-flowering shrubs. The rose of Sharon, whether used as a hedge or ornamental bush, should be pruned in the fall after it has finished blooming. Shortly after flowering is over these plants begin to form new wood, and it is upon this new wood that the next season's blooms will appear.

Hedge and shrub pruning is based upon the principle that the plants must be allowed all possible time between blooming periods; hence the gardener watches closely for his earliest opportunity to prune

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as soon as the blossoms are gone, so there may be practically a year of new growth before the next season. Of course this principle applies to spring as well as to fall shrubs; for instance the forsythia, which is such an early bloomer that it must be pruned as soon as the blossoms fall, so it may have until the next spring to stock up with new wood upon which to hang its golden bells. No reactionary tactics will work in shrub pruning. It is off with the old and on with the new if you want blooms next season.

Incidentally this pruning, which should be a little each year and not a heavy hacking of the plants to make up for time lost in previous seasons, is needed to keep the plants in symmetrical form. The trim clipping of the privet hedge is perhaps our most common example; but to apply such a system of pruning to flower shrubs, set singly or in border groups, is a mistake. The sight of a syringa bush, for example, sheared bare on its lower branches, while its top spreads out broad with an expanse of blossoms too high for our plane of vision, is the worst kind of a garden blunder; and if your groups of weigelas, deutzias and the other favourites are too much

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crowded in the corner allotted to them, it is far more satisfactory to thin them out by digging some up, even if you must sacrifice them bodily, than to attempt to remedy the situation by pruning the bushes low down and getting thereby a display of bare and ragged stems.

CHAPTER XXIX



INDOOR WORK

WITH the same sort and quality of plants growing in the same kind of soil, under similar conditions as to temperature and light ventilation, two persons may have very different results. This difference seems to be more true of plants growing in the house during the winter than of things in the outdoor garden. Perhaps it is due to the fact that the success of the enterprise indoors depends more upon artificial aids and less upon natural conditions. The personal equation enters into the thing, and failure is often expressed by the familiar remark, "I can't make plants grow for me no matter how hard I try or how much attention I give them."

Try it again this year. It is time now to get ready for the inside gardening, by which interest in a garden may be carried right through to next spring, without any cold-weather break.

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There is a double source of supply of plants for the house — those that you remove from the garden and put into pots and the new plants you raise from slips or cuttings taken from the parent growths. It is well to avail yourself of both in order to get a more continuous supply of blossoms. The young geranium, for example, which has been out in the garden all summer and has been pinched back to save its flowering energy, should be potted; its flowers will be among the first to add to the colour of the room. For flowers late in the winter depend upon the plants that may be formed now by rooting slips. The same rules apply not only to that old house favourite, the geranium, but to nearly all the indoor plants.

For cuttings or propagation by slips the methods are very simple, differing between the soft-stemmed plants and the woody ones in only a few details and in the length of time required for getting roots. For propagating the herbaceous or soft-stemmed plants, such as carnations, chrysanthemums, geraniums, fuchsias and begonias the slips may be made from the stem or the leaves. The stem is much surer and it is hardly worth while to try the leaves

INDOOR WORK

except for the sake of an interesting experiment with the begonias. The thick and fleshy begonia leaf is sure to form roots when the stem of that leaf is inserted in fine, clean sand or gravel and kept moist.

Sand should also be used for the stem cuttings rather than garden soil, which is likely to cake when subjected to indoor conditions, and is also liable to be supplied with worm and insect life that will be roused into activity by the warmth of the room and prey upon the slips.

Select the cuttings with reference to their hardness, choosing stems that break easily rather than older, tougher parts of the plant which merely bend. The younger growth will not only take root more quickly in the wet sand, but will throw out much finer and more pliable roots, with a capacity for absorbing more moisture and plant food. The cutting should be taken off just below a bud or eye of the main plant, because a new root system develops more surely at one of the joints in the stem structure. Most of the leaf growth should be removed from the herbaceous slip, as it simply adds to the area from which the moisture can evaporate, and thus increases wilting.

Such easy-going and easy-growing plants as gera-

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niums, fuchsias and verbenas will strike root in a week. Carnations may take a fortnight or more, while a month is a fair allowance for the more woody specimens, such as roses and azaleas.

Two inches of sand in a dish is all that is necessary for starting the slips. Place this in your sunniest window and keep the sand thoroughly wet every day. As soon as a stem takes root and thus becomes a complete plant transfer it to a small pot for individual treatment, taking care always to coddle it a little for the first few days by protecting it from the direct sun and allowing it extra water.

The second method to get plants for the house is to transfer them bodily from the open ground to the pots in which they are to pass the winter. Remove the garden soil from the roots as carefully as possible, so as not to tear the fine root hairs. It is better that the soil for the winter growth should be a fresh supply rather than that from the garden. The best potting soil is a combination of one-third well-rotted barnyard manure and two-thirds clean loam. The two parts should be thoroughly mixed, and if the whole is well pulverized by being run through a coarse sieve so much the better for the

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plants. Place a layer of broken flower-pot fragments in the bottom of the pot to provide drainage; and it is a good thing to cover these bits of porous clay with a thin layer of excelsior to prevent the earth from working down into the crevices and clogging the drain.

Each plant should have a pot to fit it — that is, there should be a margin of an inch and a half or two inches between the bottom and sides of the pot and the roots. This will give ample room for the root system to develop, without allowing it to straggle too far at the expense of the growth of the plant above ground.

When first set in their pots all plants should have a good watering. Afterwards this part of the treatment should be given with care. Too much moisture is as bad as too little, as it will rot the roots. A dry surface is not always a sure indication of the condition of the soil below. The expert can tell by the sound when he taps the outside of the pot with a stick, and perhaps you can get the knack by practising for a while on earth-filled pots that you know are moist all through and on others that are dry.

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A day temperature of from seventy to eighty degrees, with a night temperature about fifteen degrees cooler, is the ideal condition for practically all plants grown in the house.

The chief pests will be the small green aphids and the tiny red spider. Get rid of the aphids by sprinkling the plants with snuff or tobacco dust or by watering them with a solution of tobacco leaves and stems. You are almost sure to have the aphids, but it is easily controlled. The presence of the red spider means that the atmosphere is too dry. Remedy that by wetting down all the foliage, and then prevent further trouble from the same source by keeping open pans of water in the room to provide moisture by evaporation. The spider will live only where it is very dry.

If the soil in which the plants are first potted is of the right sort they will seldom need added fertilizer in the course of the winter. But if they make poor growth, or if the leaves are not a good healthy green, the needed plant food can best be added in the form of liquid manure. Get this by suspending a bag of cow manure in a tub of water overnight. The water will make a sufficiently rich dressing. Or

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you may topdress by working into the surface of the soil a very little bonemeal.

Avoid drafts and do not move the plants about. Plan your indoor layout with reference to the best available location for each variety, giving the ferns the shadier places, and then adhere to the plan. A plant is a creature of fixed habits and it resents being moved from a spot where it is thriving merely to satisfy the whim of its owner.

The better success you have this winter with the indoor venture the better gardener you will be next summer out in the big patch, for you will learn many things that you don't dream of now. There is more time to study the growth of things close at hand. Much less time is required for the drudgery of weeding and keeping things cleaned up. You don't have to stoop over to examine this or that peculiarity of a leaf or stem or blossom. You have no worry about too much or too little rain, for that is all regulated, just as you can fix the temperature by the simple device of covering the plants with newspapers at night or regulating the furnace damper to suit them. Note the habits of growth, where the new leaf or blossom comes with regard to the other

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parts of the plant, and keep account of the time that each part of the development requires.

Lessons for this window-garden laboratory need not be confined entirely to things that are grown to look at. Try a little forcing of some fruit or vegetable; perhaps not enough for a real meal, but just for a bite and for the satisfaction of proving that you can do it. A tomato vine is within the possibilities, and a head or two of lettuce can be grown in the shadier part of the window garden, near the ferns. If you have a section of the porch glassed in and some means of heating the enclosure you might produce a melon.

Strawberry forcing is interesting winter work for the amateur. Take good plants from your own bed or get the right sort from the seedsman, telling him what you hope to accomplish. Put them into six-inch pots with a good rich mixture, one-third of which is old manure. In the beginning they should have a night temperature not higher than forty-five degrees and not much more than that by day. After the first fortnight the plants may have a higher temperature, and when they begin to blossom they may have about the same conditions as those best

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adapted to the flowering of the geranium, with ample sunlight.

Remember that many strawberry plants are pistillate — that is, without stamens and pollen and therefore incapable of producing fruit unless grown within fertilizing distance of bisexual plants. So be sure to get a variety that has complete flowers, with both the male and female parts. Even then it will be necessary to do the work of pollination artificially, for there are no birds or insects and no wind in the house to assure the transportation of the pollen from the stamens to the pistils. This can be done with the aid of a fine camel's-hair brush.

This matter of pollination opens up all sorts of possibilities for the amateur in the way of cross breeding and producing new varieties. Try an experiment with carnations. They are about the easiest thing for the beginner to work with and the results come within a year after the experiment is made.

Here is a simple problem offered just by way of illustration: Suppose you have some white carnations and some red ones. Bag the flowers that you select to work with or else move the plants far

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enough apart so that there will be no danger of their cross breeding even in the house. Select the most perfect plants of the two colours that you have, taking into consideration height and stockiness of the stems, condition of the leaves and shape as well as size and colour of the blossoms. With keen, fine-pointed scissors cut off all the stamens of the white blossom, taking care not to jar off any of the pollen. Then brush the pollen from the stamens of the red flower on to a watch crystal and from that remove it with the camel's-hair brush to the pistil of the white flower. Now reverse the process with another pair of white and red flowers, transferring the pollen of the white to the red, after cutting out the stamens of the latter. Nature will do the rest of the work. Let the two flowers go to seed. Plant the seed, carefully marking the two groups, and in eight or ten months you will have flowers on the new plants.

RHUBARB AND MUSHROOMS.

Rhubarb is the food plant most easily fooled into doing something out of season. In fact it is taken in by a trick of temperature so readily that it almost seems a shame to take advantage of its simplicity

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and you ought to blush next January when you are eating pie made from your own fresh stalks. So, without advising or urging it, we shall simply tell how the shameful trick may be done. Just put the rhubarb down cellar and keep it dark and it will never know the difference, but will give you as juicy and palatable a crop this winter as you may expect next spring from rhubarb which is treated fairly and allowed to stay out-of-doors and follow Nature's course.

The only difference is that the deceived rhubarb will not have quite so much colour as that which leads a normal life out in the wind and sunshine.

Dig up the rhubarb roots just before the ground freezes too hard for you to remove them without tearing, but expose those roots till they do freeze. Then put them down cellar in slightly moist earth and they will immediately begin to throw up shoots of pie plant. Just that overnight freezing, after the digging, has completely fooled the roots into thinking that they have passed a long winter of rest and comfort in the open garden and that it must be time to resume work. Complete darkness in the cellar is necessary to keep up the delusion. If the basement

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is a light one simply put the roots, with the soil, in the bottoms of barrels and cover the barrels. Of course the temperature of the cellar must be about that of the open air in April and May.

Speaking of cellars naturally suggests the matter of mushrooms. The mushroom resembles the hen's egg more than any other thing that grows in the earth, in that it is counted before it is hatched, that the mere thought of growing it provokes optimistic dreams of sure and big and profitable crops. The home gardener who doubts his ability to grow potatoes — even the amateur who is skeptical as to success with so simple a thing as a radish — takes it for granted that all he needs is a brick of spawn and a box of dirt in his cellar to get an abundance of mushrooms. He multiplies a prospective yield by the highest price per pound in the market report and gets for his product a daily supply of mushrooms for the family plus a small fortune in the first winter.

But mushroom beds do sometimes fail to produce anything. There are three main causes of failure — poor spawn, too much or too little moisture, and the wrong temperature. Avoid all these usual stumbling blocks and follow instructions in the making of

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the bed and the chances are fairly good that you will get mushrooms — say a pound to every square foot of your bed — between the time of your first gathering and the final exhaustion of the bed. Half a pound of mushrooms sautéed and served on toast makes a good meal for a family of three persons, so a bed four feet wide and ten feet long, or forty square feet, may be expected to be a real factor in the producing of wholesome, palatable food when an outdoor garden is frozen stiff.

Mushrooms will grow in a temperature of from forty-five to sixty-five degrees. They will do their best between fifty and fifty-eight degrees. In making the bed you must depart from the familiar outdoor rule to have well-rotted manure, and get fresh horse manure from the stable. If there is plenty of straw in it so much the better. Mix this manure with earth taken from under sod which is itself free from manure and therefore free from the spores of poisonous toadstools. The proportion should be about four-fifths manure to one-fifth soil. Mix the two thoroughly and fork the whole mass over three or four times a week for a month to prevent excessive heating or fermentation. During its preparation the

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compost should be kept under sashes away from the rain.

When the material has been thus prepared take it down cellar and make the bed by spreading successive layers of the compost over the entire area which the bed is to occupy. A layer of not more than two inches should be put on at a time, and beaten down with the back of a spade before the next is applied. The total depth should be about a foot.

Careful account of the temperature of the new bed is to be kept from the outset by sticking the bulb of a thermometer down into the mass and leaving it where it can be read frequently. Within the first three or four days the heat from the closely packed manure should register a hundred degrees, possibly a little more. Then it will begin to decline, and when the thermometer registers eighty-five or ninety degrees it is time to put in the spawn.

Undoubtedly you will get this spawn from your seedsman in the form of a brick. Break it up into two-inch pieces and force them down into the compost about six inches apart each way and two or three inches below the surface. It is much easier

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to use a stick or dibble for making the holes in which to plant them. Cover each piece and firm the compost on top of it, leaving the surface of the whole bed as smooth as before planting.

For the next eight or ten days Nature has to be left alone and a very interesting process goes on throughout the bed. This spawn, or mycelium, is a thread-like growth developed from mushroom spores or that powdery substance found on the gills underneath the mushroom cap. It is made up into bricks with compost and kept cool and dry until sold for reproduction. As soon as the pieces of this brick are again brought under the influence of the growing conditions of the compost they begin to develop and spread, or "run the bed," as the saying is. This process requires nearly a fortnight. When it is completed you take a hand again in the operation and "case" the bed. This consists of covering it with an inch and a half of good clean loam that is barely moist. For casing avoid both heavy clay soil and one that is thin and sandy. It is worth while to screen the loam before putting it on, to get rid of all stones and rubbish that might interfere with the straight and easy upward growth of the mushrooms.

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Up to this time very little if any watering has been needed. That of course must be left to individual judgment. If the surface seems at any time to be too dry or dusty moisten it very slightly with a gentle spray. When the mushrooms begin to appear the bed will require more water and should have a light sprinkling once or twice a week. But no mushroom bed should ever be heavily watered. Probably more mushrooms grown by amateurs are killed off by rot and black spot, due to excessive moisture, than by any other cause. The sprinkling should be done whenever necessary immediately after the pulling of the matured mushrooms.

After the bed is in full bearing the mushrooms must be picked at least every other day — daily if there is a sufficient quantity for the day's use or if the bed is crowded. If they come up too thick it is well to pick even the buttons, as the small mushrooms are called, before the edges of the cap break away from the ring that holds it to the stem and spread out. Of course, the buttons are edible; some persons prefer them to the full-grown article. A mushroom gains practically nothing in weight after the cap breaks from the ring.

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A perfectly good bed may be ruined or materially impaired for further productiveness by careless gathering. Each mushroom must be taken by the cap and stem and gently twisted until it comes out with the least possible disturbance of the soil. Otherwise some of the mycelium from which more mushrooms are to come will be torn and destroyed. Fill all holes left after gathering.

The life of a bed is very uncertain. It may last anywhere from five weeks to three months. When it ceases to produce that is the end of it so far as mushrooms are concerned, and it will be a waste of time to try and renew it with another brick of spawn. The compost itself is exhausted and must be cleaned out entirely to get rid of any insects or fungi that might injure a new bed made in the same place.

The soil and manure of the discarded bed will make excellent fertilizer for the vegetable or flower garden in the spring.

Insect pests in the mushroom bed are not serious. They may be easily eliminated by putting arsenic or Paris green on bits of potato or cabbage leaves and leaving the poisoned bait beside the bed.

There are various other things you may do in

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your cellar in the course of the winter if you are sufficiently forehanded to provide yourself with a good working supply of loam under cover before the ground gets too full of frost. For example you may start early lettuce and tomato plants if there is a window in the cellar wall high enough to afford a supply of sunlight that will supplement the heat from the furnace.

Seeds will start in boxes near the furnace or on top of it, if it is encased with brick, without the influence of the sunlight, but they will be yellow, spindling, worthless things. If the window is there start these plants by all means, and then transfer them to a hotbed outdoors in early spring.

If there is any room in that cellar after making the mushroom bed, hiding the rhubarb roots, and storing the winter supply of summer-grown crops, be sure to have a work bench. Every gardener should be also a carpenter. There are many things necessary in the garden that add a great deal to the cost of it when bought at the stores, but which can be made for little or nothing if you will provide yourself with a serviceable bench, a box of good tools, and a little lumber. Trellises can be made

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ready for the tomato plants, label stakes can be fashioned out of old shingles, tools can be repaired.

All the side boarding and the uprights for hot-beds and cold frames can be cut and fitted in the cellar workshop, and the chances are that they will be much better made in a leisurely winter than if left until the time they are needed. Work out some simple irrigation system for the garden and make as many feet of V-shape wooden trough as you will need to distribute water, without having to do a lot of carpentering work next summer when the dry spell comes and you need all your spare time to weed and cultivate.

Make a lot of tent-shaped covers, open at the bottom, with the two ends and back of wood and the front of a single pane of window glass. These devices will enable you to have melons long before your neighbours by making early planting possible. Put one of these covers over a newly planted hill with the glass side toward the sun, and the soil where the seed is will be much warmer than the surrounding ground. These forcing devices can be kept over the plants until danger of cold is past; then the melon vines will have a flying start of two weeks.

CHAPTER XXX



SUGGESTIONS FOR THE GARDEN CALENDAR

JANUARY.

WATCH the thermometer in the hotbed. If it runs low bank up the bed with fresh manure.

Now is the time to cut scions from your favourite apple trees for grafting on the old trees of poor varieties. In a couple of seasons you can change the old to the new.

Watch for bare spots on the lawn during severe weather. Cover with snow or straw to protect the sod.

Trim the old canes of the raspberries and blackberries, leaving enough new growth to hold up the bushes. Cut out about half of the tops of the gooseberry and currant bushes, saving the new wood.

Sow in the hotbed or flats early cabbage and cauliflower, celery of the self-blanching type, onion seed

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of the large globe sorts. Late in March these may be removed to the cold frames to harden off.

Sow lettuce, radish, beets, and put in onion sets in the hotbed for early table supply. Keep the hotbed filled by planting new crops when any of the earlier lettuce or radishes are pulled.

Grafts on cherry and plum may be made now. Use the liquid grafting wax in cold weather.

FEBRUARY.

If the season is mild uncover bulb beds and hardy border plants in sections in the latitude of Indianapolis and southward. In more northerly regions wait until March 15th.

When the soil thaws put in a trench of rich manure a foot deep, with six inches of rich loam over it, and plant the sweet peas in this loam.

Well-rotted stable manure may now be applied over the garden plat to soak in as the ground thaws.

Don't add lime now, but save that until after the ground is ploughed or spaded. Lime should not be added with stable manure.

Examine all of your fruit trees closely for scale. If you find the tell-tale circles about the size of a

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pin head prepare to fight the San José scale. Whale-oil soap will kill it and a pound in two gallons of water and a scrub brush are all you need to do the cleaning.

Finish pruning the grapes and brambles.

MARCH.

The last chance to prune is during the first mild days. To delay is to rob the trees of the strength used in forcing out leaves on the useless limbs.

Uncover the bulb beds, mulch the surface with fine-cut litter or sand if the soil is full of clay.

Spray trees, shrubs and rose bushes for scale insects.

Clean off the strawberry beds. Transplant hardy vegetables, such as cabbage and cauliflower. Put out onion sets and early peas and radishes and beets in the open ground.

Put out the dahlias and gladioli in borders and beds in protected places where the sun strikes.

Dig the trenches and put in the sweet peas six to eight inches deep with plenty of well-rotted manure.

Watch the hotbeds and cold-frames especially at this time. Sudden rains, hail, changes of tempera-

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ture, frost and alternating clouds and sunshine may do great damage within a short while. Hence one must not forget to adopt the frame to meet these changes.

The best protection against hail is to cover the glass with a straw mattress or a couple of layers of old carpet.

Finish your early spraying before the trees have pushed their buds so far as to be injured by strong mixtures.

APRIL.

There is no more planting to be done this season under glass or indoors, except perhaps a supplementary planting of tomato seed. Thin out peppers, eggplants and tomatoes in cold-frame.

Get potato seed cut and ready to go into ground. This is not too early to plant them.

Plant beets and parsnips and put out the onion sets.

Cut brush or prepare a stout trellis of twine for the pea vines to cling to. Do not use wire.

Be ready for the blossom-time spraying of the peach trees with arsenate of lead. Apply when the petals begin to drop, to catch the curculio.

Sow good grass seed on the bare patches in the lawn. There are varieties of seed specially adapted

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to different purposes — that is, for shady places, damp places and dry spots. Get the right kind.

Begin the watering of the sweet-pea bed, first dissolving an ounce of nitrate of soda in a gallon of water. Plant lettuce, carrots, spinach, early cabbage and early cauliflower seed.

MAY.

Make the first planting of string beans and start a new row of peas to follow those which should be well along by this time.

Experiment with companion cropping as a means of getting the maximum food product from the garden by intensive methods. One good combination includes lettuce, cabbage and radish.

Early turnips can go in now.

Make the first planting of six-week bush beans.

Get the poles set for the limas. A foot and a half in the ground is none too deep to make them secure against winds. Also save time by forking manure into the hills where the limas are to be placed.

Keep a garden diary. Careful noting of what is happening in your garden from day to day this season will be of great help to you next year as a guide and basis of comparison.

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It is thinning-out time for the vegetables that were planted early.

Put a very light dressing of nitrate beside the lettuce plants and rake it in. This will force leaf growth and help the heading up.

Start another row of peas for the succession.

Plant melon and summer-squash seed.

Use the hoe every day to keep out the weeds and keep in the moisture. From now on rain is a doubtful quantity.

JUNE.

This is the time to start the herbs, either as borders or in a patch by themselves.

There is still ample time for another planting in the succession of peas to give them a start before wilting hot weather begins.

Spring rains have been as beneficial to the weeds as to your vegetables. Use the hoe.

Spray for plant lice.

Plant cucumbers in richly manured hills of sandy loam.

Thin out the beets, carrots and lettuce, and give all the remaining plants in the rows a thorough cultivation.

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Do a little hand work in pulling out those spears of grass and young weeds that are getting ready to choke the new corn.

Plant more six-week beans for the next instalment of the all-summer succession.

Set in the open ground the hot-weather plants — tomatoes, peppers and eggplants.

For the next two months mow the lawn once a week unless there is a drought. If the ground is poor the cuttings left on the lawn will help to enrich it. If the turf is good the cuttings will be appreciated in the poultry yard or they may be used as a mulch in the berry patch to keep the fruit clean.

Tie the young tomato plants to the stakes now. The less swaying they do in the wind the better for them.

First peas are about ready to pick through the central part of the country. Get rid of the vines as fast as they are through to make room for other vegetables. The gardener in Maine expects to have his first peas with salmon on July 4.

Spray the melon vines for blight.

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JULY.

Start another row of sweet corn ; also more beans, peas and lettuce.

Mulch the small fruits and thin the fruit on trees if there is too much left for the best results after the natural dropping of June is over.

Dig some wood ashes into the soil round the squash and melon vines. This will furnish an extra supply of potash, very useful just now in making fruit. Pinch back the ends of the vines.

Don't let any weeds go to seed. It would mean more work than necessary next year.

Plant seed for late lettuce and spinach.

Go bug hunting every morning in both the flower and vegetable gardens.

This is the season for pruning many of the flowering shrubs.

AUGUST.

Examine the roses carefully and cut out all old wood — the wood that has just finished flowering.

After thinning and pruning roses, a good application of liquid manure or powdered sheep manure will help them greatly.

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If the chrysanthemums have not already been staked no time should be lost in doing this. A stake to each shoot, loosely tied, will insure big blooms and avoid loss from wind storms.

Get evergreens from the nurseryman for the permanent planting about the grounds. August is the month for setting them out.

Cultivate the home orchard once and then sow a cover crop of clover.

Make the new strawberry plantation from the potted layers.

If the onion tops begin to droop that is the sign to take in the harvest.

Hoe the celery for the last cultivation preliminary to banking up.

SEPTEMBER.

Get your planks ready for the blanching of the celery.

Thin out the dead wood on the fruit bushes.

There is still time for starting the new strawberry patch from the plants produced by the runners of the old one.

Sow turnips, beets and carrots and get ready for planting the spinach.

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Gain a year by renovating your lawn this fall.

Cheesecloth covered frames over late crops will lengthen the growing season.

Seed a permanent pasture if you have a patch on which you can keep a cow.

Cut out all old wood of the blackberry and raspberry vines. Leave about four new canes to each plant.

Root the cuttings from the geraniums and other bedding plants to get a new supply for next year.

Pinch back the chrysanthemums.

OCTOBER.

The onion crop should all be harvested, dried and stored by this time. The winter's potato supply should be in the cellar.

Plant lettuce under glass.

Before moving the tender flowering plants back to winter shelter see that they are free from insects.

New beds of rhubarb and asparagus can be started now.

Finish the banking up of celery and endive.

Rake up the leaves for a mulch wherever needed in the garden.

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Cover the strawberry vines.

October is the month for planting the fall bulbs. It is also the month for digging, drying and storing the bulbs to be planted in spring.

Clean up and burn all garden clutter and diseased plants.

Burn asparagus tops and manure the bed.

Spread well-rotted manure over the lawn.

Start parsley in the kitchen window garden.

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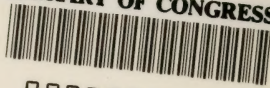
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